MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE. Assistant Editor: HERBERT C. HUNTER.

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The MONTHLY WEATHER REVIEW is based on data from about 3500 land stations and many ocean reports from vessels taking the international simultaneous observation at Greenwich noon.

Special acknowledgment is made of the data furnished by the kindness of cooperative observers, and by R. F. Stupart, Esq., Director of the Meteorological Service of the Dominion of Canada; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. I. S. Kimball, General Superintendent of the United States Life-Saving Service; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. N. Shaw, Esq., Director Meteorological Office, London; H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Rev. L. Gangoiti, Director of the Meteorological Observatory of Belen College, Havana, Cuba.

As far as practicable the time of the seventy-fifth meridian is used in the text of the MONTHLY WEATHER REVIEW.

Barometric pressures, both at land stations and on ocean vessels, whether station pressures or sea-level pressures, are reduced, or assumed to be reduced, to standard gravity, as well as corrected for all instrumental peculiarities, so that they express pressure in the standard international system of measures, namely, by the height of an equivalent column of mercury at 32° Fahrenheit, under the standard force, i. e., apparent gravity at sea level and latitude 45°.

FORECASTS AND WARNINGS.

By Prof. ALFRED J. HENRY, temporarily in charge of Forecast Division.

The remarkable period of cold weather east of the Rocky Mountains which began in April came to a close in Texas, Oklahoma, Arkansas, and Louisiana in the early part of June. From the Lake region and the Ohio Valley eastward to the Atlantic it continued until about the middle of the month, thus completing a period of continuous cold weather in those districts which is unparalleled in the history of the weather service. Previous cold spells occurred in 1857, 1874, and 1875, but in these cases the cold weather did not extend into the month of June as in the present year. The effect of this cold weather was to greatly retard the growth of vegetation up to about the middle of the month. In Colorado and over the Rocky Mountain districts the cold weather of June prevented a rapid melting of the snow, and as a consequence there will be an abundance of water for irrigating purposes.

The month opened with a well-defined low (barometer, 29.50 inches,) central in southern Indiana, and a high (barometer, 30.10 inches,) central over New England. Altho pressure fell over New England and the Lake region, the center of this storm remained almost stationary for twenty-four hours, during which time a secondary center developed off the Virginia coast; in the meantime cloudy, rainy weather, with fresh northeast winds, prevailed over New England and the Middle Atlantic States and thence westward to Lake Michigan. Under the conditions as described, the temperatures ranged from 8° to 20° below the seasonal average thruout the region of easterly winds. The secondary center which developed over the Virginia coast on the 2d soon became the main storm, and as such drifted slowly northeastward along the coast. Meantime the drift of the surface winds over New England, the Middle Atlantic States, and the Lake region continued from an easterly quarter; the weather was therefore cloudy and cold with occasional rain.

An explanation of the failure of the Ohio Valley low to move in its normal path would throw much light on the cause or causes of the cold weather. Such failure can hardly be ascribed to the interposition of high pressure over New England, since the barometer continued to fall in that district. A second fact, that as yet lacks explanation, is that a shift of the winds from easterly to southerly, which almost universally causes a rise in temperature in Atlantic coast districts, generally failed to do so during the continuance of the cold weather. For example, on the 5th a well-defined area of low pressure, with fairly steep pressure gradients, past eastward from the Lake region to the mouth of the St. Lawrence. This storm caused the winds over New England and the Middle Atlantic States to shift to southerly, but the temperature did not rise as generally happens in a case of this sort. It would seem as if either the lower layers of the atmosphere were chilled to a great extent, both vertically and horizontally, or else the period of southerly winds was too short to actually transport warmer air from lower to higher latitudes.

The change in the drift of the highs and lows which terminated the cool weather in northeastern districts occurred on the 16th. Three days previous to that date an area of high pressure appeared over Lake Superior and gradually worked south-southeastward so that by the 16th it had reached the Ohio Valley with its longer axis running northeast and southwest.

The significance of a southward as compared with an eastward movement of an area of high pressure lies in the fact that the former gives an opportunity for the transfer of the balance of pressure from the north to the south, as a result of which the winds over the central valleys and northern districts become southerly and remain so until pressure in the northern part of the country again becomes greater than in the southern.

Normal temperatures were reached in northeastern districts on the 17th and continued thereabout until the closing days of the month when a repetition of the pressure conditions which had occurred earlier in the month caused two days of cold, rainy weather, with easterly winds in New England and the Middle Atlantic States.

A period of cold weather set in west of the Rocky Mountains on the 13th and continued with but little interruption until the 19th. During its continuance light to heavy frosts occurred in Nevada, Utah, northern Arizona, Colorado, and Wyoming and snow fell in the mountain districts of California, Oregon, Idaho, and Montana. A depth of 4 inches was recorded at Bellview, Idaho, on the 22d instant. Light snow was also recorded at Cleveland, Ohio, on the 5th, and frosts occurred east of the Rocky Mountains, as follows: Week ending June 3, light to heavy frosts were general in the Lake region, Ohio Valley, New England, and the Middle Atlantic States, light frosts also occurring as far south as western North Carolina, northern Alabama, and Arkansas; week ending June 10, light frosts occurred in the western portion of the upper Lake region and in the lower Lake region; week ending

June 16, light frosts occurred in exposed localities in the lower Lake region, and the northern part of the Middle Atlantic States on the 12th and 13th. Light frosts occurred on the cranberry bogs of New Jersey on the 13th.

Tornadoes occurred in Illinois, Indiana, and Kentucky on the 7th, and in Kansas on the 23d.

Thunderstorms were unusually numerous in Iowa, Nebraska, South Dakota, and Maryland on the 24th, and in New England on the 25th and 26th. Heavy rains fell in Tennessee on the 7th and 8th, and in Montana from the 20th to the 23d.

The weather in the British Isles was for the most part controlled by depressions moving in from the Atlantic, of which there was almost a constant procession during the first half of the month. The temperature was below the normal and there was considerable rain. High pressure prevailed in Iceland until the 6th; after that date the barometer was relatively low, under the influence of the depressions which moved northeastward over the British Isles.

Pressure was continuously high at the Azores with the exception of the 7th to 10th.

BOSTON FORECAST DISTRICT.

The first half of the month was unseasonably cold, with much cloudy and unsettled weather. The conditions changed on the 18th, and during the remainder of the month the weather was quite pleasant, with the daily temperatures generally above the monthly average. The mean temperature of the month, entire district, 62.2°, is 2.5° below the normal, and with the exception of 61.3° in 1902 and 59.5° in 1904, is the lowest for June during the last ten years. The precipitation was nearly normal. It was, however, unevenly distributed. The least rainfall was in Rhode Island and the greatest in Connecticut and in Maine. There were no severe windstorms during the month. Storm warnings were displayed on the 1st and on the 30th. Shipping experienced considerable delay and inconvenience from fog during the first half of the month.—*J. W. Smith, District Forecaster.*

NEW ORLEANS FORECAST DISTRICT.

No special warnings were issued. There was no general storm along the Gulf coast during the month. Temperature conditions were moderate. The rainfall was deficient over the greater portion of the district.—*I. M. Cline, District Forecaster.*

LOUISVILLE FORECAST DISTRICT.

The month as a whole was cool; over a large portion of the western half of the district it was also dry. The rainfall at Louisville was the least for any June during the last thirty-six years. In the eastern half of the district, however, the monthly rainfall was normal, and in many places considerably in excess, altho mostly made up of a few heavy thundershowers. A number of damaging rains and one or two cloud-bursts occurred locally in Kentucky the first part of the month. The most damaging of these occurred the night of the 7–8th, when the town of Gradyville was practically wiped out of existence and 21 lives lost, due to a cloud-burst flooding Big Creek suddenly and sweeping away houses and people before the inhabitants became aware of the danger.

There were one or two quite cool periods but no frosts; also no unusually high temperatures occurred.—*F. J. Walz, District Forecaster.*

CHICAGO FORECAST DISTRICT.

Storms of moderate intensity visited the upper lakes on the 1st, 4–5th, 10–11th, and 30th. Lake interests were forewarned regarding these storms, and no marine casualties due to stress of weather have been reported.

Following the occurrence of frost in the Northwestern States on the 5th, temperatures did not exhibit notable features. Rainfalls were rather frequent and usually occurred in connection with thunderstorms.—*E. B. Garriott, Professor of Meteorology.*

DENVER FORECAST DISTRICT.

No special warnings were issued. The month was cool thruout the district, the deficiency in temperature being marked in New Mexico, western Colorado, and Utah. Several light frosts were noted in western Utah, and light to killing frosts at stations of high altitude. Rainfall was distributed irregularly, less than the normal occurring in sontheastern Wyoming, central Colorado, and in Arizona, and an excess in the remainder of the district. Dry weather in the central mountain region, and especially the prevailing low temperatures acted as a check on the melting of the snow; and instead of the snow-fed streams reaching unusually high stages, as might reasonably have been expected from the amount of snow on the upper drainage basins, the melting was relatively gradual. While high stages were general from the middle of June, the usual time of the maximum flow, the stages reached were not destructive. At the close of the month the highest point had not been attained in the upper reaches of many of the streams rising near the Continental Divide.—*F. H. Brandenburg, District Forecaster.*

SAN FRANCISCO FORECAST DISTRICT.

The month was abnormal in the matter of rainfall, but about normal in temperature. At San Francisco the rainfall amounted to 1.28 inches, which is, with one exception, the largest June rainfall shown in a record covering fifty-seven years. In June, 1884, conditions were somewhat similar to those of the present year. The month began with unsettled weather in the northern portion of the State and there were frequent thunderstorms in the mountains. The pressure continued low over the Pacific slope for the first six days. The rain area seemed to move slowly southward and eastward, clear weather prevailing after the 8th. There was a return of the unsettled conditions on the 11th, and light rains were general in California and Nevada until the 15th. There was a heavy snowfall in the Sierra on June 11 and the amount on the ground at Summit was increased from 48 to 59 inches. The latter half of the month was more normal altho there were thunderstorms in the north on June 21 and 22.

There were no frost nor storm warnings issued during the month.—*A. G. McAdie, Professor and Forecast Official.*

PORTLAND, OREG., FORECAST DISTRICT.

There was but one storm of note during the month and it made its appearance off the Washington coast the evening of the 9th, and moved slowly northeastward. The disturbance caused general rains in this district for two days and unusually high winds for the season. Timely warnings were issued for the storm and no damage of consequence resulted therefrom. Light frost occurred in the interior of the district on several nights for which warnings were issued the previous morning.

The S. S. *President* sent this office the first wireless weather report ever received in this district at 10 p. m., June 18, 1907. The observation was taken in latitude 52° north and longitude 142° west, which is about 1100 miles northwest of Portland, Oreg.

The annual rise in the Columbia River was featureless. The river rose at Vancouver, Wash., from 18.5 feet on the 1st to 20.1 feet on the 10th. It then fell slowly and reached a stage of 17.3 feet at the end of the month. It is still above the flood stage at Vancouver, Wash., and Portland, Oreg.—*E. A. Beals, District Forecaster.*

RIVERS AND FLOODS.

The floods of the month were more or less local in character. In no instance was the stage of water abnormally high, and nowhere were the losses and damage of great amount, except in western Montana and that portion of the Red River watershed lying in northwestern Louisiana above Shreveport and

in southwestern Arkansas. The floods in western Montana were caused by heavy rains that fell from June 20 to 23, inclusive, and much damage was done to growing crops, railroads, and bridges. The Red River flood was due to heavy rains over the upper watershed between May 24 and 31, Arthur City, Tex., reporting a fall of 7.20 inches on May 31. The highest stage reached at Fulton, Ark., was 31.5 feet, 3.5 feet above the flood stage, on June 4, and that at Shreveport, La., 26.9 feet, 2.1 feet below the flood stage, on June 13. The first warning, issued on May 27, was to the effect that a stage of 30 feet was probable at Fulton in about five days, and all interested were advised to take steps to protect their property. Supplementary warnings were issued on May 28 and June 2. The failure of the river to reach the flood stage at Shreveport was doubtless due to the comparatively dry condition of the bayous, lakes, and the low country between Fulton and Shreveport, as well as to some breaks in the new levees in the State of Arkansas, south of Fulton.

The losses in crops, principally cotton, are estimated at over $500,000, of which about three-fourths were in Arkansas, and one-fourth in Louisiana north of Shreveport. No levee breaks were reported in Louisiana, but much damage was inevitable as thousand of acres of unprotected lowlands in Louisiana are cultivated. There was no loss of live stock, a very important matter in this section, as the warnings gave all ample time in which to remove all portable property.

The next floods in point of importance were those in some of the Texas rivers. Flood stages were general except in the Brazos and upper Colorado, and considerable damage was done to crops, bridges, etc. Warnings were promptly issued for these floods, and they were highly commended by all interested, especially by those residing along the Trinity River where the floods were most pronounced and persistent.

Heavy rains on June 1 caused a moderate flood in the James River east of Scottsville, Va., for which warnings were issued on June 2. Some docks at Richmond were covered for a time, a few cellars filled, and some meadow lands overflowed, but, aside from the inconvenience, no damage was done, as all movable property had been placed beyond reach of the water. The highest stage reached at Richmond was 14.7 feet, 2.7 feet above the flood stage, on June 3. Another flood of still more moderate character occurred on June 15 and 16 as a result of heavy rains on June 13 over the upper watershed of the James River. The usual warnings were issued, the usual conditions were experienced, and no damage was done.

There were also short floods of a minor character in the lower Roanoke, the Wateree, Santee, lower Wabash, and the Missouri River east of Kansas City, for which warnings were issued at the proper times. The annual rise of the Columbia River ended with a stage of 34.1 feet, 5.9 feet below the flood stage, at The Dalles, Oreg., on June 5, and with a stage of 20 feet, 6 feet above the flood stage, at Vancouver, Wash., from June 5 to 7 and 9 to 11, all inclusive. The highest stage reached at Portland, Oreg., on the Willamette River, was 19.2 feet, 4.2 feet above the flood stage, from June 6 to 8, inclusive, and on June 10.

The highest and lowest water, mean stage, and monthly range at 291 river stations are given in Table VI. Hydrographs for typical points on seven principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississipi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Professor of Meteorology.*

SPECIAL ARTICLES, NOTES, AND EXTRACTS.

TORNADO AT WILLS POINT, TEXAS, MAY 25, 1907.

[The following items are copied from the Wills Point (Texas) Chronicle, issued May 30, 1907.]

At 6:20 o'clock Saturday evening [May 25] * * * a tornado past over the eastern portion of Wills Point. Everything in its path was literally destroyed, three lives were taken, twelve people injured, and much property damaged on either side of the route traveled by the tornado.

This fury of wind formed about two and a half miles south of the town in the Brown pasture. Parties saw it when it seemed to be but little more than an ordinary whirlwind, but as it moved it increased in size and destructiveness.

This infant giant was first seen south of the Brown big barn. It seemed to follow the course of a ravine for some distance west, then turned north, a little east. Several times it seemed to veer in its course. Had it gone due north from its place of formation it would have gone well to the east of the town; had it proceeded upon the course when it first veered to the west it would have mist the town some distance. As it was it past over the eastern portion of Wills Point. * * *

The tornado moved slowly, as if to deliberately destroy everything in its path, but at the same time give the people ample opportunity to escape. This whirling demon was seen long before it reached the town, and, like the picture of some giant hand with the finger pointing ever toward you, it lookt to each person who saw it as if it were coming directly toward him. There was a hasty retreat to storm cellars, and to this fact alone is due the marvelous escape of so many people. As the tornado gradually approached, and as its course was known, hundreds of people watched it; the awe-inspiring scene, with its mighty roar and its whirling black top, as tho a hundred furnaces were in blast at one time, can never be forgotten. The air was filled with débris, and those who watched the progress of the storm did so with bated breath, knowing it was leaving death and destruction in its wake, yet they were powerless to aid. * * *

A heavy rain, accompanied by some hail, preceded the storm, but there was no rain during its passage thru the town, and in a short time after it was comparatively clear. * * *

It was at first generally thought that the storm gathered on the Brown ranch, two and a half or three miles south of town, but the observations of a number of people seem to bear out the idea that it originated much farther south. At least it was first seen near the homes of Spikes and Wilson, 6 miles south of town. It was in its infancy there. Parties at the Brown barn saw it also when it was quite small, and it was then thought to have originated there. C. J. Simmons, living a mile and a half west of Myrtle Springs, saw it form from his home. [Myrtle Springs is 11 miles southeast of Wills Point.] It appeared to him to be some 6 miles west of his house, and there seemed to him to be two or three smaller ones that finally united. He described it as having the appearance of a small, black cloud of peculiar aspect rising in the air and whirling rapidly. Each time it rose there would be a long tail to it, but in the whirling that would disappear until it made dips, when the tail would again appear. After several dips and rises and the consolidation of several smaller ones it began to move forward. Mr. Simmons and his brother watched it till it past over Wills Point and out of sight beyond. * * *

Where the fury finally expended itself is not known here. Emory [18 miles northeast of Wills Point] was visited by a tornado about the same hour, but it is certain that it was not the same one. * * *

A lace curtain was found about 7 miles north of the town. To the curtain was pinned a post-card that showed it came from one of the houses destroyed in town. * * *

A dispatch from Sulphur Springs, * * * 35 miles northeast of Wills Point, reports that J. B. Pickett and D. N. Rape, living 10 miles south of that place, found several pictures [photographs] which they brought to town. These are supposed to be from Wills Point. * * * There was a canceled check for a small amount on a Wills Point bank picked up * * * 2½ miles northwest of town. * * *

From Emory (it is reported) an old letter was picked up to-day * * * addrest to Wills Point, showing it had been blown from that place. [i. e., from Wills Point, 18 miles northeastward to Emory.] * * *

From Martins Mill, 23 miles south-southeast of Wills Point, it is reported that Saturday afternoon [May 25], between 4 and 5 o'clock, while the people of Martins Mill were engaged in observing a tornado raging in the forest between Martins Mill and Walton, some one noticed a funnel-shaped cloud with a smoky appearance forming about 1 mile south of that place. [Walton is 5 miles southwest of Martins Mill]. Only a glance was necessary to see that it was a tornado making its way directly toward the town. * * * It traveled in a northerly direction, passing * * * west of the resident section of the village, the business section lying directly in its course. * * *

From Canton, 13 miles south-southeast of Wills Point, it is reported that Saturday afternoon, about 5:30 o'clock, there was visible to many of the citizens a tornado cloud, formed in the southwest. The cloud seemed to divide, one portion going in an easterly direction, visiting the neighboring village, Martins Mill, situated 11 miles southeast of Canton. * * * The storm traveled on, taking a northerly course, visiting Rast Community [2 miles north of Martins Mill]. * * *

From Colfax, 19 miles southeast of Wills Point, it is reported that late Saturday afternoon a terrible tornado * * * past a few miles west of the place. * * *

Two photographs of the tornado were forwarded by Mr. D. S. Landis, in charge of the local office of the Weather Bureau at Fort Worth, Tex. They were taken by Mr. George Alford, of Wills Point.

FIG. 1.—The tornado cloud of May 25, 1907, passing thru Wills Point, Tex. The camera faced east-northeast; the cloud is distant about 500 yards and is moving northeast.

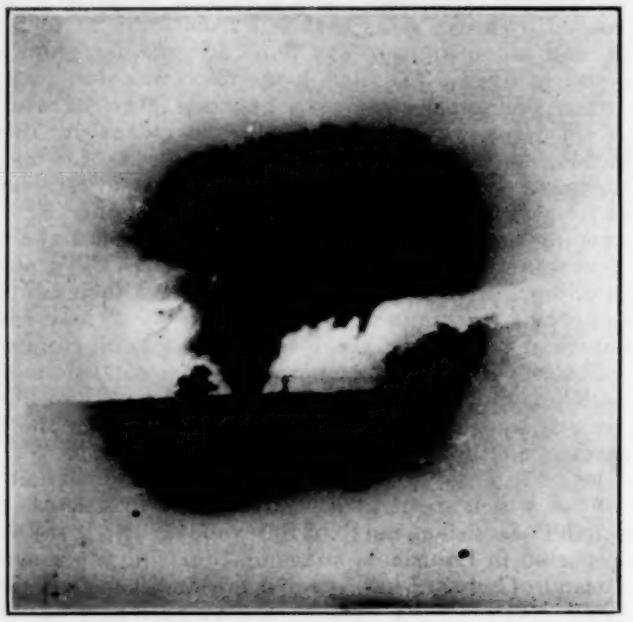

FIG. 2.—The tornado cloud of May 25, 1907, receding from Wills Point. Tex. The camera faced north-northwest; the cloud is distant about 3 miles and is moving northeast.

NOTES FROM THE WEATHER BUREAU LIBRARY.

By C. FITZHUGH TALMAN, Assistant Librarian.

The report of the Transvaal Meteorological Department for 1906, issued in 1907, shows that 375 stations in the Transvaal and 1 in Rhodesia were reporting to the central station at Johannesburg, an increase of 86 in one year. Of these 32 were equipped with barometers. All the observers except at the central station are volunteers or are attached to other government departments, and receive no remuneration for their meteorological work.

Mr. Alexander Watt has been elected meteorological secretary of the Scottish Meteorological Society to succeed the late Dr. Alexander Buchan.

A letter from Sydney Observatory states that the several state meteorological services of Australia are to be brought under the central authority of the federal government about the end of this year. Since July, 1906, the meteorological department of Sydney Observatory, which controls meteorological work thruout New South Wales, has been independent of the jurisdiction of the government astronomer, under whom it was formerly placed.

As a consequence of the great Valparaiso earthquake of last year the Government of Chile has invited Count Montessus de Ballore to establish a seismological service in that country.

The Chilean Government has just published the seventh annual volume of ter-daily observations at its coast stations.[1] We note the establishment of a station at Punta Arenas, on Magellan Strait, the observations dating from January 1, 1905. This is of special interest because several earlier series of observations at Punta Arenas, dating from 1853, have been marked by important discrepancies and the climate of this region has not yet been satisfactorily established. (See Meteorologische Zeitschrift, Bd. 8, 1891, p. 352–354). The Chilean service maintains two other stations on Magellan

[1] Anuario del Servicio meteorolójico de la Direccion del territorio marítimo. Tomo sétimo, correspondiente al año 1905. Valparaiso, 1907.

Strait, viz, Islote de los Evanjelistas and Punta Dungeness, at the west and east ends of the strait, respectively, and the terdaily observations of all three stations are published *in extenso*.

The Indian Meteorological Department has prepared a series of pilot charts of the Indian Ocean, in the form of an atlas, showing the normal monthly conditions as regards pressure, winds, and currents for the region north of latitude 12° south. This work is to be published shortly.

The Indian Meteorological Department has been experimenting with a special form of recording barometer to register without attention four months at a time. If the apparatus proves successful it is intended to install it on the summit of Chur Peak, which is inaccessible during the winter months, and by the help of an observer at an inhabited station lower down the mountain to secure accurate information regarding vertical pressure gradients.

Symons's Meteorological Magazine for June, 1907, contains some particulars regarding the proposed removal of the English Meteorological Office from its present rather cramped quarters in Victoria street to a new building in South Kensington, in the vicinity of the notable group of buildings devoted to the arts and sciences which includes the Natural History Museum, the Victoria and Albert Museum, and the Imperial Institute. The Meteorological Office is to be housed under the same roof with the District Post and Telegraph Office for South Kensington. This arrangement will do away with the necessity the office is now under of maintaining private telegraph wires and a staff of telegraph clerks, as all the telegraphic work will be done by the post-office staff in an adjoining room. We do not doubt, however, that the loss of the Meteorological Office as a near neighbor will be felt by the Royal Meteorological Society, which is domiciled at 70 Victoria street; while, reciprocally, the Office will miss the close proximity of the extensive and well-administered library and archives of the Society.

At the New York meeting of the American Physical Society, March 2, 1907, a paper was read by C. C. Trowbridge entitled, "On atmospheric currents above 50 miles from the surface of the earth."[1] The region in question is far above the highest levels attainable by kites and balloons, and the author states that its currents can be studied only by observations of meteor trains. He has tabulated the results of 61 observations of meteor train drift; and these show that in middle latitudes the drift of the trains at great altitudes is not steadily to the eastward, as might have been supposed, but may be in any direction, tho an easterly movement predominates.

On April 14, 1907, Dr. Stefan C. Hepites, the founder and first director of the Meteorological Institute of Roumania, was relieved of the active administration of the institute, at his own request, after a service of twenty-three years, and appointed honorary director. Mr. I. St. Murat succeeds him as director. Doctor Hepites will continue to take part in the purely scientific work of the institute.

Mr. C. J. Hering, a veteran meteorological observer of Dutch Guiana, died May 30 last, at the age of 78. Mr. Hering was observer for the Smithsonian Institution as early as 1857, and afterward made observations for the United States Signal Service, the Meteorological Institute of the Netherlands, and the Bureau Central Météorologique de France.

The accompanying chart, fig. 1, shows the distribution of the meteorological stations which the Germans have recently established in and near their colony of Kiaochau, China. At the central station, Tsingtau, observations have been made since July, 1898, and these have been published periodically in the Annalen der Hydrographie (Berlin); also, in part, in Heft IX of Deutsche Überseeische Beobachtungen, issued by the Deutsche Seewarte at Hamburg. All the Tsingtau observations are to be brought together in Heft XV of the latter publication. Heft XIV, which has just appeared, contains the complete series of observations to the end of 1904 for all the stations except Tsingtau.

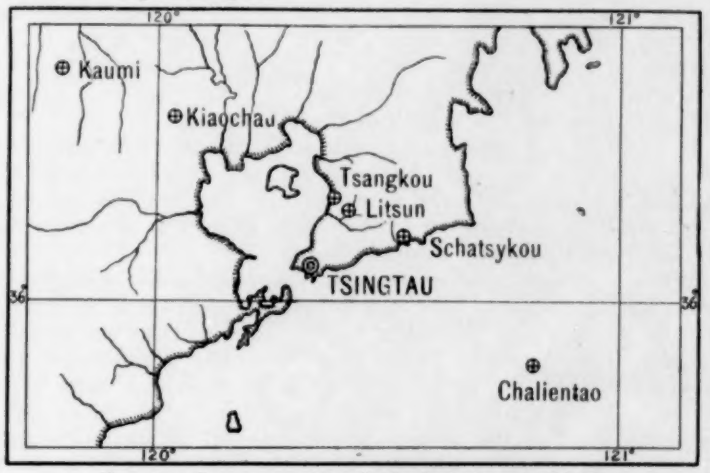

FIG. 1.—German meteorological stations in China.

Doctor Heidke, of the Deutsche Seewarte, has kindly communicated to us the location of the station Schatzykou—which is not shown on any map in the Weather Bureau Library. The rest of our chart is based upon the official Karte von Ost-China, issued by the Cartographic Section of the Royal Prussian Survey, 1901.

RELATIONS OF THE U. S. WEATHER BUREAU TO THE RAILROAD MAN.

We copy the following items from the address of Mr. H. W. Richardson, local forecaster, Duluth, Minn., before the Northern Railway Club on December 28, 1906:

During this century meteorology has made great advance and it is now accorded a place in the very front rank of the sciences. From a small beginning the Weather Bureau has grown constantly larger and more efficient. Insurance and other experts figure that it returns $20,000,000 or more each year in property saved to the people. And this on an annual investment of about $1,500,000 ought to be considered a fairly good proposition as regards dividends, even by railroad men, who, as most of us are led to believe, are so skilled in the art of altitudinous finance that they can even extract money or its equivalent from the commonest grade of aqua pura. And vessel experts also state that their losses are now only 25 per cent of what they would be without the storm warnings.

In railroad construction some of the important considerations are the facts regarding temperature and precipitation averages and extremes. Culverts must be made which will suffice to carry off flood water due to heavy snow or rain, and bridge construction must be such as will withstand the effects of flood and ice. Consideration must also be given the possibility of landslides due to torrential rains. The matter of temperature extremes constitutes a very important item, as iron and steel are very often greatly affected by contraction and expansion. Besides temperature conditions also materially affect the tensile strength of metals.

In all structural metal work climatic data play an important part, and due allowance must always be made for the action of temperature as well as wind force. In the first Brooklyn

[1] Physical Review, Lancaster, Pa., June, 1907, pp. 527-529.

bridge, for example, the variation due to the effect of temperature amounts to 3 feet vertical at the center each year. The river span also rises and falls each day under diurnal variation of heat and cold. The iron work of the bridge is practically in four parts, and when they expand with the heat the parts slide one past the other and thus correct what otherwise might prove a serious fault.

Peculiar climatic conditions often promote the corrosion of metals, and this effect may be induced by moisture or atmospheric electricity, or conditions that favor *development* of electrical action in the metal parts.

The heaving effects due to frost in the ground must be allowed for in all construction work, particularly in the foundations of bridges and trestles. This is determined by the character of the ground and the severity and frequency of low temperatures and the length of the winter period.

In cases of expected heavy rain, snow, sleet, windstorms, or floods, traffic is regulated accordingly, and weak points along the line are patrolled even more rigidly than usual in order to avert possible washouts or broken rails, or give timely warning should such a calamity actually occur.

When a severe cold wave is anticipated, consignments of perishable goods may be either refused or carried at shipper's risk, or heaters are provided for the cars, or they are roundhoused, or perhaps the goods may be either immediately removed from the car, or transferred to another and safer type of car. At such times the weight and length of trains must be diminished, as the steaming efficiency of an engine is less in cold than in warm weather.

For many years, during cold weather, particularly near the close of the navigation season, the shippers of iron ore in this section have experienced more or less trouble on account of frost penetrating the ore.

When freezing occurs the best known expedient at present is to thaw the ore by steam, and that is necessarily an expensive and tedious process. Besides frozen ore also means aggravating delays in the loading of vessels. The delay of a few days now and then means the loss of a trip or two and consequent financial loss to the vessel operator, while if a large number of boats miss a trip or two in a season because of such trouble the results might be far-reaching.

Some three or four years ago the writer conceived the idea that this matter was, to some extent, capable of better regulation as far as the weather was concerned, and with that end in view the subject has been very carefully studied. From a rather crude arrangement at the start the scheme has been so elaborated and expanded that at present forecasts in considerable detail as to temperatures and storm conditions are daily furnished each ore dock and each ore railroad superintendent, as well as the principal mining companies.

The aim has been to make the forecasts as reliable and as useful as our capabilities and utilities will permit, endeavoring to so gage the forecasts and their distribution as a cooperative feature that the railroads can have plenty of manageable ore at docks during a mild spell in the frost season, while during very cold and stormy weather to aid them through this information in maintaining a nice balance between the mines and docks as regards sufficient fresh and relatively warm ore at docks or en route to meet vessel tonnage, and to keep down to the very lowest minimum the necessity of steaming, by curtailing shipments to docks during unusually critical periods. Storms, you know, sometimes delay expected vessels, and that in itself sometimes results in much mischief; for if the weather is cold enough this miscarriage of schedule may result in train loads of frozen ore.

During the critical period of this last season, the ore handling problem was generally worked out very satisfactorily as regards dispatch. This, of course, is due to increased perfection in railroad organization and equipment. From my own standpoint I think those engaged in this trade are to be congratulated on their intelligent application of the weather forecasts, for many of the situations that at times confronted them required the very highest quality of business judgment and quick action to forestall the elements.

It is not claimed that the scheme is yet perfect, nor that our forecasts are infallible, but we hope to effect improvements from time to time, and, if possible, keep pace with the wonderful development of this traffic so far as the weather is concerned. If, instead of your having to thaw 5 per cent (or whatever the average figure has been) of all the ore shipped in the frost season, we can assist you to reduce that to 2 per cent (an allowance chargeable to storm-delayed vessels, railroad schedule interruptions, or weather forecast errors), we shall surely feel justified in believing that we have rendered you a service.

An arrangement that would effect a considerable improvement locally would be the creation of what one might term a railroad-weather clearing house. That is to say, one or more railroad officials at selected points might be designated to whom we could telephone our daily forecasts and warnings, these officials or employees in turn to distribute the information to other offices. In this way a large area could be quickly and efficiently covered. Through the courtesy of Mr. McGonagle this method is already in operation in the Wolvin Building.

Both the Duluth & Iron Range and the Duluth, Missabe & Northern railroads telegraph the daily forecasts and warnings to their important stations. This feature might be adopted with advantage by all the other railroads in this section. It would more than pay for itself in connection with railroad operations and convenience to people along the line.

LEGAL DECISIONS AS TO CYCLONES.

We have already had occasion to publish several legal decisions bearing on the work of the Weather Bureau or the use of meteorological terms. In a recent article on insurance we especially urged that if a policy is to protect one's property from wind, lightning, waves, or other meteorological phenomena, then the fact should be explicitly stated without any reference to cyclones, tornadoes, hurricanes, thunderstorms, or any other general meteorological terms. The importance of this caution is well illustrated by the extensive and expensive suit, resulting in an appeal to the United States Circuit Court of Appeals, Eighth Circuit, for the District of Minnesota, May, 1906.

We copy the following opinion in this case, No. 2375, in full from the official records of the circuit court as delivered by Judge Philips, May, 1906.

The Maryland Casualty Company, plaintiff in error (hereinafter for convenience designated the defendant), issued its policy of insurance to the defendants in error (hereinafter for convenience designated the plaintiffs), for a term of one year beginning the 7th day of June, 1904, and ending June 7, 1905, whereby the defendant insured the plaintiffs—

"against direct loss or damage to property owned by the assured and described in the said schedule and also for loss from liability of the assured for damage to merchandise held in trust or on commission or sold but not delivered by being removed, situate on that part of the premises occupied by the assured as described in said schedule, and caused, during the term of this insurance, by the accidental discharge or leakage of water from the automatic sprinkler system now erected in or upon the building occupied wholly or partly by the assured * * * ; but the total aggregate liability of this company hereunder shall in no event exceed $25,000".

The policy, however, was made subject to certain specified

conditions. The ninth condition, which is the subject matter of this controversy, is as follows:

"This policy does not cover loss or damage resulting from any leakage occurring at any point outside of the inner surface of the cellar floor or walls; nor resulting from the explosion, rupture, collapse or leakage of steam boilers or steam pipes; nor resulting from any interruption of business or stoppage of any work or plant; nor resulting from freezing; nor resulting from fire or violation of law; nor resulting from or caused by the willful act of the assured, nor by the neglect of the assured to use all reasonable means to save and preserve the property insured hereunder; nor resulting from or caused by invasion, insurrection, riot, civil war or commotion or military or usurped power, or by order of any civil authority; nor resulting from or caused by earthquakes or cyclones or by blasting or explosions of any kind, or by the fall or collapse of any building or buildings, or part thereof."

On the 20th day of August, 1904, between 8 and 9 o'clock p. m., the city of St. Paul was visited by a windstorm which did injury to the plaintiffs' building, breaking the pipes of the automatic sprinkler, whereby the goods in the store were flooded by the freed water, doing damage to an extent of over $25,000. For the recovery of this alleged loss suit on the policy against the defendant was brought. To this action defendant interposed the principal defense that said injury resulted from a cyclone, and was, therefore, excepted from the operation of the contract of insurance. On trial to a jury the plaintiffs obtained a verdict in the sum of $26,225, for which judgment was rendered, to reverse which the defendant prosecutes this writ of error.

The controlling question presented for determination is whether or not the windstorm occasioning said loss was a cyclone within the meaning of the policy. A brief summary of the work of that storm will disclose its character.

The cloud which contained its fury was first observed by Professor Whitebreicht, the head of the Mechanics Arts High School of the city of St. Paul, who was at his cottage at Lake Minnetonka, about 35 miles from St. Paul. He testified that between 8 and 9 o'clock p. m. of August 20, 1904, his attention was directed to the threatening clouds, which he described as a "great large cloudy-mass, balloon in shape, and coming down to a decided point at the bottom, as observed from the lake, to the southeast of the portion we were occupying". It moved down the lake toward St. Paul and was apparently moving with the wind, and without evidence of revolution; "it was an oblong balloon, decidedly oblong, with a pendant". He testified that it struck his house, broke a large pane of glass, 30 to 40 inches square, removed the frame work of the screens, driving one with such force against a table as to punch a hole in it. It blew down the chimney of his house, and a maple tree eighteen inches in diameter, taking off the whole top and taking it 60 feet diagonally across the cottage without striking the roof. It blew in the windows and took off the roof of an adjoining cottage; turned a large barn around at an angle of 45°, taking off the roof and scattering the contents.

When it reached the vicinity of the city of St. Paul it carried out spans of the steel and iron bridge spanning the Mississippi River, precipitating them to a considerable distance, and did great damage to trees and houses on an island in the river. It struck the city at the north bank of the river, and its general course, with some eccentric divergencies, was from southwest to northeast, covering a pathway of 300 feet or more in its sweep. Near the river the destructive force of the storm made its first impression upon the city. It blew from a railroad track and overturned box cars. It wrecked the Imperial Theater and demolished the Tivoli Concert Hall, killing some people therein. In its pathway through the city it smashed windows of various sizes and strength, blew down signs and took off cornices from buildings, scattering their fragments in large quantities over the streets. At Third street it raised and dropped a sky light 50 feet square which covered the open court of the Pioneer Press Building; blew in its windows on the Fourth street side, creating some consternation among the inmates of the building. It unroofed the Davidson block at the corner of Fourth and Jackson streets. It leveled to the ground the freight depot of the Chicago, Milwaukee & St. Paul Railway. At Smith Park it broke, blew down, and uprooted a large number of trees. It carried off the top of the brick building occupied by a wagon company, the roof of which, after being blown off, dropped back on the remaining building. At another place in the vortex of its pathway it took out a section of the wall of a brick building. On the next street it wrecked into fragments a frame church building. In Lafayette Park locality chimneys were toppled over, some buildings were demolished, and trees in and about the park were broken and uprooted. It is true that the evidence tended to show that most of the trees about the park were comparatively young and those blown down were easily restored in place by the park commissioner. On the hill farther on the destruction to houses and property was marked. In places sidewalks were lifted up on either side of the street and tumbled in mass in the center of the street, showing the eccentric motion of the wind. One sidewalk was lifted into the air, carried over a stonewall fence, and deposited a hundred feet or so in a yard. Telephone and telegraph poles of great size and strength were blown down, broken off, and twisted in different directions. One house, as shown by a photograph in evidence, was blown diagonally around, entirely off of one corner. Some of the trees, broken or twisted off and uprooted, were of large size and apparent great strength.

While it is to be conceded that the direction in which the trees fell was generally in that of the storm, yet as evidence of its concentric motion trees standing in opposite positions fell with their tops together. The limbs of trees had the appearance of being twisted off.

As indisputable proof of the effect wrought by this narrowly confined windstorm, the street, park, telegraph, and telephone inspectors and repairers were all out as early as the light of the next morning would admit to look after the injury done on their respective lines and beats. So piled up were some of the streets with débris, trees interlaced with tangled telephone and telegraph poles, that at places the inspectors were unable to drive through the streets, according to their testimony.

This storm was traced some twenty miles or more beyond the city, and its energy and violence were marked in the throwing down of fences, the breaking of trees, and demolition of or injury to buildings.

As a circumstance indicating its alarming character, and as evidence of the impression it made upon their minds, newspaper men in their respective offices were thrown into excitement, and as soon as the storm sufficiently abated reporters went out in the night and early the next morning to observe its work of desolation, and so impressed were they with its character that all the newspapers of the city, perhaps with one exception, the next day in their issues described the city as swept by a cyclone of great violence. Conceding the criticism of plaintiffs' counsel that newspaper reporters may be given to sensational exaggeration, the fact remains that the storm was of such a character that notwithstanding what may be assumed to be their city pride to have the outside world understand that their beautiful city was immune from things that maketh afraid, they did publish the alarming impressions made upon them by the storm.

Superadded to all this is the testimony and the report of Mr. Oliver, in charge of the Weather Bureau at the city of St. Paul. After an examination of the work of this storm in the city he sent in his report to the Department at Washington. In the official report he stated that a heavy rain began during

the morning before, attended with thunder; that it was clear early in the forenoon but at 10 a. m. it became cloudy; at 7:45 p. m. a thunderstorm began without any noticeable premonition except that the air was quite sultry; that the clouds were of a yellowish tinge; and it assumed proportions of a severe storm at 9:45 p. m. The wind blew at a rate of 90 miles per hour from the northwest; and at 9:52 p. m. the anemometer and wind-vane supports were blown down, which ended further registration of the direction and velocity of the wind. The receiver and cover of the rain gage were blown away. The storm, which was about two and one-half miles in length and about 300 feet in width, entered the city from the southwest, destroying two spans of the high bridge; crossing Harriett Island, on which are located the public baths, it did much damage to shade trees and parts of the building. He then stated the damage to the Tivoli Hall and Empire Theatre, as heretofore stated. His report continues as follows:

"The storm then moved in a northeasterly direction across the business portion of the city, doing damage to business blocks, breaking glass, unroofing buildings, uprooting and breaking shade trees in two of the public parks and along the streets; some dwellings and school houses and churches in the line of the storm were either entirely destroyed or greatly damaged.

"The distribution of débris along the path of the storm and the direction of the uprooted trees, especially in the parks, clearly showed the presence of a whirl. The wind in passing evidently rose above some portions of the city in its path, doing slight damage, then descending to the earth with its besom of destruction.

"There was some hail about the size of a pea from 9:48 to 9:52 p. m. The lightning was constant and vivid. The estimated value of the property destroyed is $500,000. The following persons were killed: Hocanson, Louis F., 586 Brunson street, killed at Tivoli; Kventon, Geo., 579 Toronto avenue, killed at Tivoli; Robinson, Viola, killed at House of Good Shepherds. * * *

"The barometer did not indicate any inordinate disturbance of the air during the afternoon and evening, but at about the time the storm struck it fell very suddenly, the barograph indicating a fall of from .75 to .24 in a very few minutes".

He then proceeded to give the readings of the barograph and the examination of the anemometer after the storm, and stated that the last register which the wind gage made was *160 miles an hour*. He had been upon like duty at various places in Texas, and at Vicksburg, and at Louisville, Ky., and had given constant attention to the subject of meteorology, and had observed many windstorms; that the velocity of this windstorm was the highest he ever saw. In respect of his examination of the condition of the city after the storm, he testified that the débris along its path lay in all directions, and that trees were uprooted and blown over, and on the northeast side of Lafayette Park they were pointed southwest and on the southwest side they were pointed northeast.

The plaintiff's building, which was a large structure of great strength, the evidence shows was stricken with such violence by the storm that strong windows on the sides of it were blown in. It blew down the tower from the building, dislocated and ruptured a pipe in the automatic sprinkler attached thereto, and carried away two skylights out of the west end and ruptured a pipe of the sprinkler beneath. The wind blew through the windows, dislodged, with such force as to lift from the racks, boxes of goods and lay them on the floor, breaking the sprinkler pipe which lay in front, thus flooding the floor with the discharged water, causing the damage claimed.

The evidence in rebuttal was principally directed to an effort to minimize the extent of the destruction to property and to show that the trees blown down about the park and elsewhere were small, and that some of the buildings destroyed were in a more or less dilapidated condition; that buildings of stone and brick structure of great strength were not materially injured. But the evidence shows, without any material contradiction, that trees 18 inches in diameter were destroyed, and that buildings of ordinary strength, serviceable for human habitation and for business, were demolished and others greatly injured.

At the conclusion of the evidence the defendant made request for an instructed verdict, which was refused.

In its charge to the jury, the court, touching the issue as to whether the storm in question was a cyclone, made the following declaration:

"Now, I don't think that anybody would say that a cyclone was a gentle storm; on the contrary I think a cyclone would be said by anybody to be, and is usually known, and is usually understood as being, a very severe and destructive storm. It is a storm characterized by certain peculiarities and characteristics, marking it as a cyclone. If we look into the dictionaries, we find that this word is derived from the Greek, the noun being *kuklos*, a circle, and the verb being *kukloein*, to move in a circle, or to move around, or to whirl around. I not only think that a cyclone has the characteristics of moving in a circle in the minds of the lexicographers and scientists, but it also has that characteristic according to the usual and ordinary and common acceptation of the term. And the atmosphere not only moves in a circle in a cyclone, but this circularly moving atmosphere also has progressive motion, of greater or less velocity, usually of a very considerable velocity, and sometimes going to the extent perhaps of 20 or 30 miles or more per hour in its onward movement. So that I think, boiling it all down, we can define a cyclone as being a violent and destructive storm of greater or less extent, sometimes its path covering only a narrow strip and at other times covering a vast and wide strip, characterized by high winds rotating about a center of low atmospheric pressure, and this center moving onward, with greater or less velocity, sometimes at a very great velocity, at others at only an ordinary rate. I think the principal force of the wind in a cyclone is in the circular motion.

"Now, the scientists seem to distinguish between a cyclone and a tornado. Both are characterized by high winds rotating about a center of low atmospheric pressure. In the cyclone, according to scientists, the area of the rotating wind is much greater than that of the tornado, this area in the cyclone being sometimes many miles in diameter, and sometimes even hundreds and thousands in diameter; whereas in a tornado the diameter of this area is smaller, being often, and I think I may say usually, only a few hundred or a thousand feet. But I think under the usual and ordinary acceptation of the terms, cyclone in its usual and ordinary acceptation and tornado in its usual and ordinary acceptation are synonymous, a tornado being a small cyclone. And if it was a cyclone at all, why then the word cyclone of this policy covers it. The distinguishing characteristic of the cyclone or tornado is that of high winds rotating about a center of low atmospheric pressure, and this center moving with greater or less velocity across the country. Now that seems to me to be what a cyclone is, and I so charge you."

Further on the court said:

"I don't think there can be any question that this was a severe, violent, and destructive storm, counsel for the plaintiff has stated so much himself; but that, gentlemen, is not enough—to establish a violent and destructive storm—that is not enough. It must also be shown that this storm had the peculiar characteristics of a cyclone, that it was what we would call a whirling storm, and that it came within the definition I have given you of a cyclone. If you believe from the evidence that it was a cyclone that ends the case".

Finally the court said:

"Of course you can have cyclones of varying strengths. I think a cyclone must be a violent and destructive storm, but it can be of various degrees of violence and destructiveness; it must be a violent and destructive storm and it must be in addition characterized by high winds rotating about a center of low atmospheric pressure and this center moving onward with greater or less velocity. It could be a cyclone without being an extremely severe cyclone".

Reduced to its ultimate analysis, before the jury were authorized to find for the defendant on this issue they were required to find from the evidence that this windstorm, no matter how terrific and destructive, must have possessed the distinctive quality of moving in a circle, rotating about a center of low atmospheric pressure, this center moving onward across the country; that it must be a "whirling storm".

As this storm occurred in a night of intense darkness, driving people who might be out doors under cover, and forbidding those within doors to venture out, exactly how the defendant was to meet by evidence the requirements of the given phenomena and characteristics imposed by the charge, is not apparent. It is quite inconceivable, in view of the evidence in this case, that the jury should not have returned a verdict for the defendant except for the fact that the storm was not seen with the eye to fix on it the peculiar characteristics indicated by the technical charge of the court.

In the very nature of the situation, the character of the storm could only be judged of, after it ceased, by observing its effect. In the effects were furnished at least persuasive evidence that this storm, in its origin and ravages, possessed the essential "whirling" movement.

Looking alone to the derivative of the word "cyclone" and its technical import, in the conception of meteorologists and scientists, it may be conceded that one of its characteristics is the presence of a circular or gyratory motion, evidenced by a twisting effect. Looking to the dictionary definitions, which are not in many instances reliable sign boards for legal construction of contracts, they are substantially as follows:

CENTURY DICTIONARY: "Any atmospheric movement, gentle or rapid, general or local, on land or at sea, in which the wind blows spirally around and in toward the center".

STANDARD DICTIONARY (1895): "An atmospheric disturbance extending over an area of 100 to 500 miles in diameter, characterized by decrease of barometric pressure toward center and by winds directed spirally inward; in some features opposed to anticyclone".

NEW ENGLISH DICTIONARY: "Meteoral. A system of winds rotating around a center of minimum barometric pressure, the center and whole system having itself a motion of translation, which is sometimes arrested, when the cyclone becomes for a time stationary".

WEBSTER'S INTERNATIONAL DICTIONARY: "A violent storm, often of vast extent, characterized by high winds rotating about a calm center of low atmospheric pressure. This center moves onward, often with a velocity of twenty or thirty miles an hour".

Vol. V, Encyclopedia Americana, gives a brief résumé of the origin of cyclones, which is by no means helpful.

Turning to the discussion of scientific men or meteorologists, it will appear that the movement of all winds is more or less circular, and that cyclones in their technical sense are not usually harmful, and are not destructive until they assume the quality of a tornado, denominated by them as "the child of the cyclone".

While it is to be conceded that where an insurance contract is so drawn as to be ambiguous and susceptible of different constructions, so that men of average intelligence might reasonably attach different meanings thereto, the court will apply that construction to it which is most favorable to the assured.

"But the rule is especially well settled that contracts of insurance, like other contracts, are to be construed according to the sense and meaning of the terms which the parties have used, and if they are clear and unambiguous, their terms are to be taken and understood in their plain, ordinary, and popular sense". *(Imperial Fire Insurance Co. v. Coos County,* 151 U. S. 562.)

It will be observed that in the ninth paragraph, excepting the insurer from liability, it does not cover loss or damage resulting from freezing or fire, "nor resulting from nor caused by earthquakes or cyclones or by blasting or explosions of any kind, or by the fall or collapse of any building or buildings, or part thereof". Applying the rule *noscitur a sociis* in searching out what must have been in the mind of the parties in the employment of the word "cyclone", there can not be any reasonable doubt that it was the purpose not to apply the insurance to loss or damage resulting from violent causes arising outside of the building where the automatic sprinkler was installed, such as blasting, or explosions, or earthquakes, or cyclones. It excluded injuries from blasting or explosions because it was well known that such external force is well calculated to so shake the building as would probably disturb and dislodge the sprinkler and cause the water to escape therefrom. It excepted earthquakes because of the known fact that they were calculated to jar the building, and probably dislodge the sprinkler and turn loose the flood of water. In the same connection occurs the word "cyclone". Inasmuch as it is common knowlege that windstorms of abnormal force or violence may so shake or topple a building as to effectually disturb an automatic sprinkler in place therein, the inquiry naturally arises, why should the parties to this contract be held to have had in mind that unless the windstorm possessed the peculiar quality of a circular, twisting motion in its sweep, so as to bring it within the technical or scientific derivation of the word cyclone, it should not come within the compass of this exception from the policy?

It is a conceded fact among etymologists, as well as matter of common learning, that words have their development and enlargement, so that in time they are used and understood among the people if not in an entirely different sense, yet so as to express and comprehend a broader application than was implied in their origin. And, therefore, they undergo in lexicography the changes attached to them in common parlance. The law in its flexibility, constantly adjusting and adapting itself to new conditions as they arise, declares that words and phrases employed in business transactions in ordinary dealings among men, shall be deemed to have been employed in their popular sense and acceptation, unless it clearly appears that they were intended to be used in their technical or more restricted sense. It is hardly to be presumed that the average merchantman and insurance agent who make these insurance contracts ever heard of the Greek word from which the term cyclone is claimed to have been derived, or that they possess any technical knowledge, or had in mind the characteristic of "high winds rotating about a center of low atmospheric pressure, and this center moving onward". But they do know the common history of the day, that in States west of the Mississippi River, like Missouri, Kansas, Nebraska, Iowa, and Minnesota, there are what are popularly known as cyclones, occurring in the spring or summer months, recognized as windstorms of great velocity and destructive violence, as distinguished from ordinary windstorms known as furious or noisy gales, but not attended with extraordinary destruction of life and property. They do know that in such regions windstorms are designated as cyclones, which, passing through a narrow strip of country, more or less confined, with such resistless force as to twist, break, and uproot trees, unroof and turn over houses and destroy property in their march, more or less eccentric in their movements. It is not too much to say that this

designation is one of common acceptance among the people.

Scientific writers, like Mr. John Elfreth Watkins, in the Technical World of February, 1905, while speaking rather derisively, bears testimony to the fact of this designation of the term cyclone among the people. He said:

"A roaring, snapping, death-sowing funnel-cloud looms up in the sky, descends to earth, ploughs through life and property for a mile or two, ascends into the air whence it came, and passes off. Ten to one the newspapers will state that a 'cyclone' visited the affected region. It all results from our eternal, inveterate habit of sticking to wrong names—for example, 'locust' for *cicada*, 'buffalo' for *bison*, and other misused terms that might be cited".

Had the policy employed the words "violent windstorm" it would in practical application have been inexpressive and vague. Had it added the word "destructive" it might have been too narrow for the assured and too liberal for the insurer. But in the use of the more generic term "cyclone", in its up-to-date significance, it clearly enough expressed and included that character of windstorm distinguished by its concentrated force and violence, so resistless as to make it especially destructive in its narrow pathway to property like buildings.

Under the construction contended for by the learned counsel for plaintiffs, and as expressed in the charge of the court, had this windstorm come, like an avalanche of mighty waters, against the plaintiffs' building and crushed it like an egg shell, as it did buildings of lesser strength, yet the insurance company should be held for damages, unless it should be shown that "in addition, it was characterized by high winds rotating about a center of low atmospheric pressure and this center moving onward with greater or less velocity, etc."

The spirit of the common law is the instinct of practical sense. Courts are most apt to approximate absolute justice in construing a controverted term in a business contract, like the one under review, by giving to it a practicable comprehensible application, rather than one so technical and theoretical as only to obscure and mystify. "For the letter killeth, but the spirit giveth life". The failure to observe this, in seeking to solve the import of the term "cyclone", as employed in the ninth condition of the insurance contract, doubtless furnished the jury the only conceivable pretext for finding the issue for the plaintiffs.

Reversing the situation: Had the policy contract insured against loss resulting from a cyclone, the insurance company defending on the ground that the windstorm in question was not a cyclone, can it be imagined that the same jury would not have found the issue for the plaintiffs, had they not been confused or felt coerced by the charge of the court imposing the necessity of direct proof of the presence in the wind of the technical qualities of a meteorological definition?

There being no disputable evidence on which reasonable minds ought to differ as to the windstorm being of the popular conception of a cyclone, as that term was employed in the policy, the court should have granted the request of the defendant for a directed verdict. The judgment of the Circuit Court is, therefore, reversed, and the cause is remanded with directions to grant a new trial.

THUNDERSTORMS AND SQUALLS.

The Editor regrets that time and opportunity have not allowed him as yet to make a résumé of our steady progress in the knowledge of the origin and mechanical phenomena attending squalls and thunderstorms. This is a matter that has been especially developed of late years by M. Durand-Gréville. We should be very glad if some one of our physicists would contribute to the MONTHLY WEATHER REVIEW a review of the work that has been done along this line of study, beginning with Espy's reports and maps of 1836. Thus for a long time we have known in a general way that thunderstorms occur principally on the south and east sides of an area of low pressure, that in fact they represent the front of a slowly descending mass of air moving northeastward and underrunning and lifting up the air near the ground, just as the cold blizzards represent slowly descending air moving southeast, on the western side of a central area of low pressure. The blizzard is a winter phenomenon while the thunderstorm is a summer phenomenon. But Durand-Gréville has added to our knowledge by showing that in every thunderstorm and squall we have a ribbon (ruban) of isobars squeezed close together, so that the isobaric chart reminds one of the graining in the surface of a beam of wood "quarter-sawed". In fact the ancient usage of French mariners is to speak of a "squall of wind" as a "grain", altho we know not the etymology of this French word. Durand-Gréville has for many years made a special study of the isobars attending these wind squalls or grains. The last paper by him was presented to the recent international competition in the prediction of the weather (Liege, 1905), and is published in full in the bulletin of the Belgian Astronomical Society, for March and June, 1906. Apparently there are very few instances in which squalls can not be foreseen by one who follows up this line of study. The memoirs by Durand-Gréville remind us of the following paper published long since by Dr. Gustavus Hinrichs and Prof. Frederick Starr.

In a first paper on the thunderstorms of Iowa, published in the Proceedings of the Davenport Academy, December, 1887, Vol. V, pages 81–99, Prof. Frederick Starr, Ph. D., of Coe College, Cedar Rapids, entered on his special study of thunderstorms for that State. Altho he had only 54 reporters for the first summer yet many interesting features were brought out. Doctor Starr stated that he was not "a professional meteorologist", but he had "a great desire to see Iowa thunderstorms carefully studied", and believed it to be a subject that would repay diligent work. We fully agree with him in this latter belief, and hope that someone may collate and analyze the data that have been published for that year, and that in fact one will be found to make special studies of the origin and development of thunderstorms in each section of our country. Just as soon as such a study has been made in the region within 50 miles around any large city it should be possible to invert the problem, and from the beginning predict whether or no the thunderstorm will in a few hours trouble that city.

We quote the following paragraphs from Doctor Starr's first paper:

Three kinds of thunderstorms seem to be reported—

First.—Storms, well defined, traveling from the west, or a western quarter, toward an eastern quarter. Time records, properly made, supply data for calculating the rate of progress eastward. These are apparently connected with the general atmospheric circulation of the United States, and occur in the southeast quadrant of a "low" area.

Second.—Heat storms, local in character; not showing a progressive movement; often unaccompanied by any wind; seldom beginning until 4 p. m. in the afternoon, or in the evening, followed by a later instalment in the early morning. They accompany extremely hot weather.

Third.—"Squalls", which are well characterized by Doctor Hinrichs in his "Bulletins" for June and July, 1882. His account has been quoted by others, but may again be copied here for Iowa readers.

"Our Iowa squalls are as serious as any on the ocean; the wind may be destructive, but it is not lifting or revolving as it is in the tornado. Roughly speaking, the squall may be likened to an extended tornado, having its axis parallel to the ground. Here, in Iowa, it generally bursts upon us from the northwest, following the southeast wind; it rolls over and strikes down upon us, usually with abundant precipitation, and soon is succeeded by the same southeast wind which it so abruptly displaced. So far as I have studied them, they come down from the northwest, progressing at the rate of 20 to 50 miles an hour. In northeastern Iowa the storm front has a tendency to bend up, so as to make the squall more nearly from the west. In like manner in southwestern Iowa its front bends westward, and hence blows more nearly from the north. The storm front is fierce in its power along a considerable distance—20 to 50 miles or more, in its front, along the earth, are struck simultaneously. As the great storm front moves on, it can be traced for 350

miles from northwest to southeast through our State. It is impossible to confound this storm with the tornado, which is fortunately very restricted in its field, mowing a swath of destruction, generally, in a direction corresponding to the line of the squall storm front, from a southwesterly toward a northeasterly point. The tornado is narrow, local; the squall at a given instant reaches a narrow, long-extended belt of land like a tornado track, but this belt of destruction is carried forward with great velocity so as gradually to sweep over a large part of the State. Again, the squall of summer is radically different from the blizzard of winter. The squall comes, reaches us, and after a few minutes leaves us, moving onward in its general course toward the southeast; the blizzard blows for hours, and even days. In the squall, but a limited amount of air comes down from the northwest, a great roll of cold and dense air falling upon us; in the blizzard, the entire atmosphere covering several States is moving as one body toward the southeast."

* * * * * * *

Three cases are mentioned of dead horses found at the barbed wire fence. I would like references to similar cases elsewhere.

The barbed wire fence, which has spread so widely since 1875, has come to be recognized as a dangerous form of lightning conductor, and the injuries to cattle are innumerable; but we believe it has been abundantly shown that the danger is entirely dissipated if only the posts to which the fence is attached are properly connected by a wire to a moist soil below. In this way every post becomes a conductor, instead of an insulator, and the electricity is carried safely below.

The distinction between the destructive winds of a tornado, a hurricane, a blizzard, a straight-line squall or derecho, as it is called by Hinrichs, or the vents de grains, as they are called by Durand-Gréville, is important for several reasons. The insurance companies, if policies specify insurance against tornadoes, are very likely to evade payment if it can be shown that the destructive wind belonged to the squall or some other class, so that farmers would do well to see to it that when they insure against damage by lightning, rain, hail, winds, etc., the policy shall say just that and no more, omitting all reference to tornadoes, squalls, cyclones, hurricanes, etc.

CLIMATOLOGY OF SPRINGFIELD, MO.

By N. R. TAYLOR.

Springfield, Mo., latitude 37° 12′ north, and longitude 93° 18′ west, is situated near the center of Greene County, of which it is the seat of justice, and is located in that part of the State popularly known as "Southwest Missouri". It is about 90 miles east of the point where Kansas and the Indian Territory touch the State of Missouri, and about 60 miles north of the Arkansas line. It is 239 miles southwest of St. Louis, and 194 miles southeast of Kansas City.

As regards topography, the city lies near the center of an extensive section known as the "Ozark Plateau", which is a culmination of the gradual rise that begins south of the Missouri River and ends in the northern portion of Arkansas. This plateau slowly decreases in height and rapidly increases in ruggedness as the border of Arkansas is approached.

"The great watershed of the Ozark uplift, which is, in general, followed by the St. Louis and San Francisco railroad, divides the district into two slopes. The waters on the north flow into the Missouri; those on the south into the White River".[1]

The site of the city itself, is, on the whole, level, the only exception being a narrow and shallow valley that slopes toward Wilsons Creek, a small stream running approximately westward, and roughly forming a dividing line between the northern and southern halves of the city.

In so far as tabulated data are concerned, the meteorological history of Springfield begins in 1877. In February of that year observations of temperature and rainfall were begun by Mr. A. M. Lapham, whose records extend thru 1879, except that observations of temperature were mist during the months of March, October, November, and December, 1879, and rainfall measurements were omitted in December, 1879. Observations were resumed in 1884 by Prof. E. M. Shepard, whose records of temperature extend from April of that year to June, 1887, inclusive, except the months of June and November, 1886, and whose rainfall records extend from May, 1884, to September, 1887, inclusive, except the month of June, 1886.

It is regretted that no reliable records exist for the full four years ending with 1883, as tradition recounts the occurrence of several meteorological events of more than passing interest during this period.

A record of rainfall from January, 1877 to December, 1887, inclusive, is compiled in The Report of the Missouri Rainfall, by Francis E. Nipher; but owing to the fact that the rainfall for the entire year of 1881, and for several months in other years, is interpolated, the normals being substituted for the missing data, only such records as are shown to be the result of actual observation are here quoted. A note in the publication referred to, describing the kind of rain gages used, the manner in which they are exposed, and the care with which observations were taken, is accepted as evidence of the accuracy of such of the data as appear in the accompanying table.

On September 27, 1887, an observing station was established at Springfield by the United States Government. It was then under the Signal Corps of the Army, but since June 30, 1891, has been under the Weather Bureau, Department of Agriculture. Since the establishment of this station all meteorological elements have been regularly and systematically recorded.

In addition to the tabulated matter in the accompanying tables, there are many authentic accounts of phenomenal weather conditions which have occurred in this section during its early history.

In the history of Greene County, Missouri, published by Perkins and Horne in 1883, the following notes are found:

The winter of 1834-5 was unusually cold. The "cold Friday and Saturday" will long be remembered. Cattle had their horns frozen, pigs and fowls perished in great numbers, and there was much damage done to fruit trees. The snow drifted to extraordinary depths, lying on the ground from December to March. It was impossible, in many cases, to go to mill or to a store, owing to the distance and the condition of the roads, so the hominy block was called into use to supply breadstuff, and the "store goods" were dispensed with.

In November, 1848, came the "big sleet", as it was afterwards known. The sleet began falling, and then came rain, hail, and freezing weather, alternately, until the ice covered the ground to a depth of 3 or 4 inches. Timber was broken down, and travel almost suspended.

The winter of 1855 was an exceptionally hard one in Greene County. On the 4th and 5th of February of that year the thermometer stood at 20° below zero, and the snow lay upon the ground to the unprecedented depth of from 18 to 20 inches. On the 19th of August following there was a sharp frost.

On January 23, 1856, snow fell in the county to a depth of 14 inches.

On the 25th of June, 1875, an extraordinary rainstorm visited Greene County. Every little stream became a river, and all creeks were out of bank, causing great destruction of property. Wilsons Creek in Springfield was 100 yards wide. The damage done in Springfield was at least $5000. This storm was general throughout southwest Missouri.

In July, 1876, the Pomme de Terre, a small stream that flows through the northern part of the county, was extraordinarily full on account of the freshets from heavy rains. Widespread damage occurred to farms lying along the banks of this stream. The height of the water was from 3 to 4 feet higher than it was ever known.

Reports indicate that all streams in southwest Missouri were out of bank in July, 1876, when, according to many verbal accounts from the older inhabitants, the heaviest rainfall occurred that was ever known in this section.

In a small pamphlet, entitled "Greene County, its Resources and Advantages", the following account of an exceptionally early spring is found:

In 1878, full-grown potatoes were eaten on the first day of May, and peas on the 5th. Strawberries, grown in the open air, were ripe on April the 5th. Peaches were ripe on the 15th of June, and corn on the 25th of that month.

The following is from the history of Greene Conuty:

The drought of 1881 will not soon be forgotten by the farmers of

[1] Geology of Greene County, Mo., by Prof. E. M. Shepard.

Greene County. In this county no rain fell from the middle of July until the 10th of September. Corn shriveled in the fields, and, taking the county throughout, was not one-half of an average crop. Fruit of all kinds was short, and potatoes and other root crops were almost an entire failure.

After a close examination of the history of this section since 1833, accounts of only two tornadoes have been found. One of these occurred at Marshfield, Mo., a small town about 25 miles northeast of Springfield, on April 18, 1880, and the other in the northern part of the city of Springfield on November 5, 1883. Many facts, oral and written, have been gathered relative to the Marshfield tornado, but the most reliable and scientific are contained in an article that was written by Prof. E. M. Shepard of Drury College, Springfield, Mo., and published in the Patriot Advertiser on May 6, 1880. Professor Shepard traversed a portion of the path of this storm, and his description indicates that all of the characteristics of the dreaded tornado were present during its passage thru the ill-fated town. This tornado resulted in the death of at least 100 persons and the total destruction of the town.

There are few more notable events in the history of southwest Missouri than that of the great storm of 1880.

Perhaps the most correct version of the Springfield tornado was published in the Herald of that city on November 6, 1883, which states that the track of the storm across the city averaged about one block in width and about a mile in length, and extended from Booneville and Division streets eastward to the boundary of the city, when it took a northerly course. Several lives were lost and a considerable amount of property was destroyed as a result of this storm.

As the occurrence of unusual and disastrous weather seems to have been emphasized by the early historians of this section, it is believed that an account of all such conditions since 1833 has been given in the preceding paragraphs.

All the facts to which attention has been directed indicate that the greatest amount of rain, snow, and sleet, the highest wind velocity, and the longest period of drought, have been exceeded prior to the establishment of the Weather Bureau station. There is reason to believe, however, that the absolute extremes of temperature, i. e., 106° and —29° that occurred on July 23, 1901, and February 12, 1899, respectively, have not been surpassed at any time during the fifty-four years ending with the year 1887, and that they now stand as the record for a period of nearly three-quarters of a century.

The highest temperature that has ever been recorded in the State of Missouri was 116°, and the lowest, 33° below zero. The former was observed at Marble Hill, Bollinger County, on July 22, 1901, and the latter at Sedalia, Pettis County, and Louisiana, Pike County, on January 5, 1884.

While the climate of this section, especially with respect to temperature, is essentially continental, a correlation of all the available data shows that periods of extreme heat and cold are comparatively rare and of short duration, and that their occurrence may always be attributed to what might be called accidental causes. Accepting only the ordinary variations of temperature incident to latitude and topography, and eliminating all modifying influences that are associated with the passage of barometric waves of abnormal intensity, the result would justify the obliterating from the records of all maxima of 90° and above and minima of 15° and below.

Conditions that produce sharp changes to colder weather in places that are separated from Springfield by only a few degrees often occur without materially affecting the temperature in this section. An illustration may be found in the winter anticyclones that develop in the far Northwest and follow the northern track in their drift eastward. While these storms invariably cause low temperatures in the extreme northern part of Missouri, their influence rarely extends as far south as this section of the State; and when any change to colder does result from these causes it is brought by the surface winds from the northeast after the disturbances have past east of the Mississippi Valley, and is rapidly followed by warmer weather as the winds veer southward.

The most significant conditions with respect to the cold waves that affect this section are exemplified by those anticyclones which attain their full strength east of the upper Rocky Mountain regions and move southeastward in the rear of receding areas of marked low pressure. The cold waves that occur under these circumstances are invariably severe, and level all climatic distinctions in Missouri, there being little difference between the several parts of the State in the degree of cold produced.

Cold waves may occur at any time during the five months ending with March, but are comparatively rare during November and March, and are much less intense than those of the winter months.

Since the establishment of the Weather Bureau station at Springfield there has been an average of about five cold waves per season, during which the temperature has fallen 20° or more in from twenty-four to thirty-six hours to a minimum of 20° or less in November and March, or a fall of 20° or more, during the period mentioned, to a minimum of 10° or less in December, January, and February.

The weather during the warmer months is modified to some extent by the passage of all barometric troughs and crests that move eastward from the Rocky Mountains, but is more directly influenced by those depressions and the following

TABLE 1.—*Climatological data for Springfield, Mo., based on nineteen years' Weather Bureau records, unless otherwise stated.*
(Latitude 37° 12′ north, longitude 93° 18′ west. Altitude 1324 feet.)

Months.	Temperature.																Relative humidity, mean monthly and annual.
	Means.			Extremes of monthly and annual means.		Mean of daily maxima.	Mean of daily minima.	Mean daily range.	Mean of monthly and annual extremes.		Monthly and annual extremes, with dates.						
	All records.	No. of years.	19 years, 1888-1906.	Max.	Min.				Max.	Min.	Max.	Day.	Year.	Min.	Day.	Year.	
	°		°	°	°	°	°	°	°	°	°			°			%
January	31.9	24	33.2	39.4	24.4	41.7	24.7	16.9	66	— 1	74	26, 30	1890	—17	24	1894	77
February	33.7	25	33.1	41.0	23.0	41.9	24.3	17.6	66	0	*76	4	1890	—29	12	1899	77
March	44.4	24	44.1	52.1	39.5	53.4	34.8	18.6	77	13	86	28	1895	3	7	1899	72
April	56.8	26	56.6	62.8	50.0	66.1	47.0	19.0	84	30	89	29	1899	22	1	1899	67
May	65.1	26	64.8	69.6	62.4	74.0	55.5	18.5	85	40	89	30	1906	32	1	1903	71
June	72.7	25	72.5	77.3	67.2	81.4	63.6	17.9	91	53	96	30	1890	46	4	1897	75
July	76.5	25	76.1	83.9	72.2	85.0	67.2	17.8	94	58	106	23	1901	53	9	1891	74
August	75.4	25	75.6	80.8	73.2	85.2	66.0	19.2	94	55	100	7	1896	44	24	1891	75
September	69.0	25	69.1	75.8	63.4	78.6	59.6	19.0	91	42	102	14	1893	†37	30	1895	74
October	57.8	25	58.1	65.8	53.0	68.0	48.2	19.8	84	32	90	5	1897	21	30	1887	70
November	45.4	24	45.2	51.1	41.0	54.0	36.5	17.5	74	18	79	5	1888	6	22	1898	72
December	36.3	25	37.0	51.8	31.3	44.8	29.2	15.7	64	6	74	25	1889	—11	20	1901	77
Year	55.4	.....	55.4	56.9	53.6	64.5	46.4	18.2	96	— 7	106	July 23	1901	—29	Feb. 12	1899	73

*Also on February 28, 1894.

†Also on September 30, 1899.

TABLE 2.—*Climatological data for Springfield, Mo., based on nineteen years' Weather Bureau records, unless otherwise stated.*
(Latitude 37° 12′ north, longitude 93° 18′ west. Altitude 1324 feet.)

Months.	Precipitation.									Snow.		Cloudiness.					Wind.				Average number of thunderstorms.
	Average.			Monthly and annual extremes (all records).		Greatest 24-hour fall.	Average number of rainy days.	Greatest number of consecutive days with—		Average.	Greatest 24-hour fall.	Average, 0—10.	Average number of days—			Total number of fogs.	Prevailing direction.	Average velocity.	Maximum velocity.		
	All records.	No. of years.	19 years, 1888–1906.	Max.	Min.			Rain.	Drought.				Clear, 0—3.	Partly cloudy, 4—7.	Cloudy, 8—10.				Velocity.	Direction.	
	Inches.		*Inches.*	*Inches.*	*Inches.*	*Ins.*				*Ins.*	*Ins.*	*Ins.*						*M. p. h.*	*M. p. h.*		
January	2.50	24	2.59	6.47	0.34	4.64	9	5	19	5.3	10.0	5.1	11	9	11	31	se.	10.9	54	w.	1
February	2.44	25	2.42	5.22	0.81	1.86	10	8	9	4.7	7.5	5.4	10	8	10	13	se.	11.4	48	sw.	1
March	3.82	25	4.11	9.05	1.13	3.33	11	7	13	1.8	5.0	5.4	11	10	10	23	se.	12.4	60	nw.	4
April	4.00	25	3.69	8.32	1.10	1.86	11	7	12	0.3	1.6	4.7	11	11	8	7	se.	12.0	54	w.	6
May	5.61	26	5.73	11.75	2.48	3.70	12	7	16	0	0	4.6	11	13	7	12	s.	10.0	60	nw.	9
June	5.53	25	5.09	15.20	1.33	3.40	11	7	13	0	0	4.3	11	15	4	8	se.	8.2	63	nw.	10
July	4.77	26	4.77	13.12	0.80	4.81	10	8	16	0	0	4.1	12	15	4	3	s.	7.7	48	nw.	10
August	4.15	26	4.17	8.21	0.75	3.20	8	8	21	0	0	3.6	16	12	3	11	se.	7.4	48	n.	9
September	3.57	26	3.73	8.52	0.37	3.90	9	8	15	0	0	3.7	16	9	5	13	se.	10.1	48	nw.	4
October	2.75	26	2.79	9.75	0.40	2.74	7	6	19	0.1	1.0	3.5	18	8	5	20	se.	9.8	42	s.	2
November	2.71	26	2.59	5.68	0.22	2.58	8	7	22	0.7	3.0	4.9	12	8	10	13	se.	10.9	48	nw.	2
December	2.65	25	2.50	11.02	0.63	4.96	8	6	16	3.0	10.0	5.3	11	9	11	18	se.	10.9	44	se.	1
Year	44.50	.....	44.13	61.00	31.72	4.96	114	8	22	15.9	10.0	4.5	150	127	88	172	se.	10.1	63	nw.	59

TABLE 3.—*Dates of extreme temperatures for period January 1, 1888, to December 31, 1906.*

Year.	Minimum below 0°.	Maximum 95° or above.
1888	January 13–16.	July 29–31; August 1, 2.
1889	None.	None.
1890	February 28.	June 30; July 7.
1891	None.	None.
1892	January 19, 20; December 26, 27	July 22; August 7, 8.
1893	January 13, 15; February 7.	July 28, 30; September 13–15.
1894	January 24.	July 1; August 10, 12–15.
1895	February 2, 4, 5, 7, 8.	None.
1896	None.	July 27, 31; August 3–9, 14, 15, 21.
1897	January 26–28.	July 7–9, 31; Aug. 1, 3, 26; Sept. 3.
1898	None.	None.
1899	Jan. 27, 29–31; Feb. 8–13; Dec. 15.	Aug. 3, 8, 9, 11, 12, 20, 23, 26; Sept. 4–7.
1900	February 17.	August 21.
1901	December 14, 15, 17–20	June 20, 21, 25, 29; July 3, 4, 9–14, 16–24; August 2, 3, 25.
1902	Jan. 26, 27; Feb. 2, 4; Dec. 26.	None.
1903	February 17; December 13, 26.	None.
1904	January 25, 26, 29; December 27, 28.	None.
1905	Jan. 14, 15, 24–26; Feb. 2, 3, 12–15.	None.
1906	February 5.	None.

TABLE 4.—*Dates of killing frosts at Springfield, Mo.*

Year.	Last in spring.			First in autumn.		
	Mar.	Apr.	May.	Sept.	Oct.	Nov.
1888	.....	.....	14	.....	3	.....
1889	.....	.....	3	.....	6	.....
1890	.....	1	.....	.....	14	.....
1891	.....	4	.....	.....	7	.....
1892	.....	15	.....	.....	9	.....
1893	.....	23	.....	.....	15	.....
1894	.....	.....	19	.....	8	.....
1895	*21	.....	.....	30	.....	.....
1896	.....	3	.....	.....	18	.....
1897	.....	17	.....	.....	29	.....
1898	.....	6	.....	.....	17	.....
1899	.....	9	.....	.....	29	.....
1900	.....	13	.....	.....	.....	1
1901	.....	18	.....	.....	14	.....
1902	.....	8	.....	.....	.....	26
1903	.....	3	.....	.....	.....	6
1904	.....	13	.....	.....	23	.....
1905	.....	16	.....	.....	21	.....
1906	*30	.....	.....	.....	10	.....

* Last freezing temperature.

TABLE 5.—*Precipitation, from Report of Missouri Rainfall.*

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Annual.
1877	.....	1.15	4.76	6.95	8.55	15.20	2.45	6.60	1.90	7.95	4.75	3.20	.....
1878	1.99	2.07	3.27	6.04	7.25	5.19	4.86	4.43	1.65	3.00	0.52	1.92	41.59
1879	1.82	0.66	1.46	2.64	2.59	2.85	1.18	1.50	0.68	0.97	4.62	4.15	25.06
1880	0.87	2.97	2.58	5.10	4.20	4.05	4.50	.....	.....	2.00	3.05	0.80	.....
1882	2.65	7.29	3.19	3.71	8.07	2.70	4.98	2.14	4.48	7.62	6.30	2.30	55.43
1883	1.05	5.65	1.68	3.11	7.30	.....	.....	.....	.....	.....	.....	.....	.....
1884	.....	.....	.....	.....	5.48	2.67	9.22	3.17	3.80	1.73	3.03	7.62	.....
1885	2.80	1.05	2.10	5.01	3.29	5.15	9.14	3.73	6.15	1.75	2.05	1.50	43.72
1886	1.55	3.43	1.50	2.90	9.30	.....	1.75	2.60	3.40	0.40	.....	0.75	.....
1887	2.60	4.10	2.50	2.80	4.60	6.65	2.63	3.29	2.43	2.08	3.27	2.39	39.34

areas of high pressure that develop over the plains of the far Southwest and move toward the middle Mississippi Valley. Rising temperature, increasing southerly winds, and rain, may be expected from a barometric minimum from this quarter, followed by cooler weather, northerly winds, and clearing skies, as the high pressure area becomes the controlling factor.

Thunderstorms are of frequent occurrence during the spring and summer months, and are one of the most prolific sources of rainfall during this season. They are, for the most part, coincident with the approach of low barometric areas from some western quarter, and are rarely of local origin.

The prevailing weather during the crop season, i. e., March to September, inclusive, is eminently favorable to agricultural pursuits. During this period the temperature for the past nineteen years has averaged 65.5°, and the precipitation, 31.29 inches. These figures, reinforced by the fact that ample sunshine occurs, exhibit an ideal condition for the germination, growth, and maturity of all crops.

HYTHERS AND THE COMPARISON OF CLIMATES.[1]

By Mr. W. F. TYLER, F. R. Met. Soc., Coast Inspector, in charge of the meteorological affairs of the service of the Imperial Maritime Customs. Dated Shanghai, China, January 4, 1905.

I have read the pamphlet "Some Climatic Features of the Arid Regions" with great interest and also the papers by Harrington and Pague to which you referred me.

By far the most instructive article is that in the MONTHLY WEATHER REVIEW for August, 1898, on the "comfort curve" ("Sensible temperatures or the curve of comfort", August, 1898, p. 362). In that article the problem that is indicated is: "What function is ideal weather of temperature, humidity, and wind force?"

This problem, dealing as it does with a three-variable function, is necessarily very difficult, the more so that wind force does not appear to be an elemental factor in the total subjective effect of climate as are temperature and humidity.

[1] The editor regrets that this interesting letter was mislaid and has so long remained unpublished. See the Monthly Weather Review, May, 1904, Vol. XXXII, p. 217. Readers interested in the subject will perhaps make use of the following bibliography:

Osborne, J. W. On a new meteorological instrument. Proc. Am. Asso. Adv. Sci., Detroit meeting, 1875.

Pague, B. S. Sensible temperatures, or the effect of heat on the body in California. July, 1895. Reprint in Am. Met'l. Jour., Oct., 1895, p. 196–198.

Harrington, Mark W. Sensible temperatures. Read before the Am. Climatological Asso., May, 1894. (Abstract in Am. Met'l. Jour., July, 1895, p. 93–95.) Intern. Med. Mag., Aug., 1894.

Ward, R. DeC. Sensible temperatures. Bull. Am. Geog. Soc., March, 1904.

Phillips, W. F. R. Sensible temperature. Trans. Am. Climatological Asso., 1896, Vol. 12, p. 16–25.—*C. A.*

In the problem which I have indicated, the matter of individual tastes in weather is to a very considerable extent eliminated. A standard of ideality of weather is not the object sought. The problem which I propose is: "In climatic conditions causing the same degree of sensation, do the correlated temperatures and humidities vary according to some law?"

In attacking this problem I premise the practicability of dividing a sensation between two roughly identifiable limits into a number of "equal" parts. This I know may be a controversial matter.

Now climatic conditions have to be submitted to indoors as well as out of doors, and taking indoor climate, i. e., out of an air movement of variable velocity, the problem is greatly simplified. The air movement caused by a punka does not affect the function, (over a certain range of hyther); it merely results in a constant. An electric fan, either movable or with variable speeds, is unsuited to an observer.

The comfort curve is, of course, included in my investigation—it is the zero hyther curve. The establishment of a mere personal comfort curve, while very interesting in its way, would be of but little use in a scheme for comparing climates, which is the main object of my investigation.

I note with interest that Mr. Osborne attempted in 1872–1875 to establish a scale of sensible temperatures from a record of individual sensations and that a year's observations from over twenty observers resulted in nothing satisfactory.

In my investigation I have very carefully selected my observers from those whose occupation and environment were such as to eliminate as far as possible the difficulty caused by a variation of these.

I consider the term "sensible temperature" to be rather misleading, temperature being only one factor in the subjective effect. It was for this reason that I felt the absolute necessity for a new term, and I coined the word *hyther* from *hydro* and *thermos*.

During the past summer I have obtained some 2000 records of hyther in Shanghai and Canton, which I will attempt to synthesize when I get the opportunity.

There is one line of investigation which I would suggest be taken up by some one—i. e., the limiting conditions of temperature and humidity in which animal life can exist. A very rough approximation to this would be of great use to my scheme.

Supposing I am able to satisfactorily establish hyther curves from 0 to 6 and also a death line far along the scale, it would probably be possible to interpolate isohyther curves between.

AN OLD INDIAN RULE FOR PREDICTING WINTER TEMPERATURES.

In a pamphlet of 1789, "On the Climate of Pennsylvania", by Dr. Benjamin Rush, reprinted in The American Museum, Volumes VI and VII, the author says:

"The Indians have long ago taught the inhabitants of Pennsylvania that the degrees of cold during the winter are in proportion to the quantity of rain which falls during the autumn".

Presumably this sentence refers to the rain that fell during the autumn immediately preceding. As the statement may refer to the eastern part of Pennsylvania, rather than to the western portion, we submit the accompanying Table 1, showing the rainfall during the months of September, October, and November, and the temperatures during the following months of December, January, and February, as recorded at the Pennsylvania Hospital in Philadelphia, from 1825 to 1888.

Out of the twenty-two years when the autumn rainfall was one inch or more above the mean, ten cases gave the mean temperature of the following winter below, and twelve cases above, the mean of the entire period of sixty-four years.

Out of thirty-one years when the autumn precipitation was one inch or more below the mean, seventeen cases gave the mean temperature of the following winter below and fourteen cases above the mean for the whole period.

TABLE 1.—*Autumn precipitation and succeeding winter temperature at Pennsylvania Hospital, Philadelphia, Pa.*

(Data from Lorin Blodget's "Climatology of Pennsylvania".)

Year.	Precipitation. Autumn.			Temperature. Winter.			Total precipitation. Autumn.	Mean temperature. Winter.
	Sept.	Oct.	Nov.	Dec.	Jan.*	Feb.*		
	Ins.	*Ins.*	*Ins.*	°*F.*	°*F.*	°*F.*	*Inches.*	°*F.*
1825	2.61	1.25	1.36	34.0	34.0	35.5	5.22	34.5
1826	2.00	5.83	1.85	34.0	27.0	35.0	9.68	32.0
1827	0.79	5.91	4.76	35.0	37.0	41.5	11.46	37.8
1828	4.62	1.39	6.71	39.0	30.0	25.0	12.72	31.3
1829	2.01	2.30	3.97	42.0	30.0	31.5	8.28	34.5
1830	2.93	4.31	5.35	37.0	27.0	28.0	12.59	30.7
1831	5.33	4.51	1.88	25.0	33.0	36.0	11.72	31.3
1832	1.40	3.41	2.50	38.0	36.0	35.5	7.31	36.5
1833	3.82	10.05	2.48	37.0	29.5	42.0	16.35	36.2
1834	3.57	3.29	3.01	37.0	32.0	28.0	9.87	32.3
1835	2.63	1.22	3.19	31.0	28.0	24.0	7.04	27.7
1836	1.82	3.59	3.34	29.0	26.5	30.9	8.75	28.8
1837	2.28	0.66	3.23	33.0	36.8	23.6	6.17	31.1
1838	9.52	4.90	3.35	28.4	29.5	33.3	17.77	30.4
1839	2.92	2.83	3.10	34.8	29.4	39.4	8.85	34.5
1840	2.50	5.73	2.49	30.7	33.3	30.4	10.72	31.5
1841	1.90	3.20	4.32	34.5	35.1	38.3	9.42	36.0
1842	1.27	1.71	3.49	32.6	38.0	28.5	6.47	33.0
1843	4.86	3.22	4.15	33.9	27.0	32.0	12.23	31.0
1844	4.03	5.03	2.95	34.2	38.0	34.5	12.01	35.2
1845	2.16	2.53	2.50	28.3	33.3	29.5	7.19	30.4
1846	0.25	2.45	7.97	35.8	32.3	33.2	10.67	33.8
1847	8.07	3.00	2.84	39.5	36.7	23.6	13.91	33.3
1848	1.81	3.75	2.34	43.2	29.0	27.5	7.90	33.2
1849	1.41	5.60	2.60	34.4	35.8	37.1	9.61	35.8
1850	7.73	1.09	3.32	36.5	35.2	39.8	12.14	37.2
1851	1.13	3.03	3.35	30.0	27.5	34.1	7.51	30.5
1852	1.29	2.27	6.06	41.9	33.1	37.3	9.62	37.4
1853	4.46	3.47	2.32	35.0	32.2	34.5	10.25	33.9
1854	3.80	1.55	2.83	31.0	35.7	27.6	8.18	31.4
1855	4.00	4.11	2.04	36.7	24.1	26.1	10.15	29.0
1856	4.01	1.30	2.07	32.7	22.4	41.0	7.38	32.0
1857	1.11	2.69	1.45	40.3	39.7	29.4	5.25	36.5
1858	1.49	1.84	5.61	37.4	34.0	36.9	8.94	36.1
1859	7.68	3.13	3.82	32.8	33.1	32.7	14.63	32.9
1860	2.85	4.52	6.13	32.2	30.7	39.2	13.50	34.0
1861	4.40	3.80	4.87	37.0	32.5	32.7	13.07	34.1
1862	3.98	4.77	4.79	33.1	38.2	36.0	13.54	35.8
1863	0.88	2.46	2.70	35.4	33.3	36.0	6.04	34.9
1864	7.16	1.82	3.93	36.8	26.8	32.6	12.91	32.1
1865	7.96	3.05	3.96	37.4	29.3	34.1	14.97	33.6
1866	8.71	4.15	1.76	33.6	25.9	40.2	14.62	33.2
1867	1.72	4.32	2.94	31.8	30.1	26.6	8.98	29.5
1868	8.91	1.74	5.28	32.2	37.0	37.7	15.93	35.6
1869	3.25	6.32	3.73	37.3	41.1	34.9	13.30	37.8
1870	1.71	3.89	2.10	35.5	31.3	33.9	7.70	33.6
1871	1.77	4.86	4.29	30.8	29.7	32.9	10.92	31.1
1872	3.82	5.36	3.38	28.2	29.7	30.6	12.56	29.5
1873	4.05	5.89	4.99	38.4	37.1	33.7	14.93	36.4
1874	3.99	1.65	2.23	36.1	25.7	26.2	7.87	29.3
1875	3.04	1.83	5.54	35.1	38.0	34.3	10.41	35.8
1876	7.78	1.21	9.03	26.9	28.6	37.4	18.02	31.0
1877	3.88	6.96	6.51	40.7	34.4	37.8	17.35	37.6
1878	1.42	2.39	2.89	33.4	28.9	30.2	6.70	30.8
1879	1.30	0.45	1.62	37.8	39.1	39.0	3.37	38.6
1880	1.68	2.09	1.96	28.0	27.0	31.0	5.73	28.7
1881	1.24	3.72	3.14	41.1	31.6	36.9	8.10	36.5
1882	13.90	1.29	1.64	33.1	28.4	34.1	16.83	31.9
1883	4.43	4.11	1.56	33.8	26.9	38.2	10.10	33.0
1884	0.27	1.90	4.01	34.6	31.0	24.3	6.18	30.0
1885	1.08	4.85	4.30	35.7	28.0	29.7	10.23	31.1
1886	1.46	2.52	4.96	29.5	30.2	35.0	8.94	31.6
1887	5.34	2.07	1.60	35.4	26.2	32.9	9.01	31.5
1888	6.50	4.01	3.99	35.6	.....	.....	14.50	.....
Means	3.61	3.83	3.56	34.7	31.6	33.2	11.00	33.2

*Of the following year.

For the ten special years of unusually heavy autumn rainfall, the character of the following winter, as compared with the mean of sixty-four years, was as follows:

1833	Warm.	1868	Warm.
1838	Cool.	1873	Warm.
1859	Cool.	1876	Cool.
1865	Warm.	1877	Warm.
1866	Cool.	1882	Cool.

For the nine special years of unusually light autumn rainfall, the character of the following winter, as compared with the mean of sixty-four years, was as follows:

1825	Warm.	1878	Cool.
1837	Cool.	1879	Warm.
1842	Cool.	1880	Cool.
1857	Warm.	1884	Cool.
1863	Warm.		

In one specific case (1879) the figures support the proverb admirably; the rainfall of 3.37 inches during the autumn of 1879, which is the lightest in the record, is followed by the warmest winter, with a mean temperature of 38.6°. But the rainfall of the subsequent autumn, 5.73 inches, which also was very light, was followed by one of the coldest winters. As was to be expected, the records give no confirmation of the Indian proverb, and yet we must believe that Doctor Rush or his adviser believed in it as having some foundation in experience. Possibly some one or two notable cases had recently occurred to establish this idea in their minds. But we see that this old Indian rule has neither practical nor scientific value. The special case of 1879, with a possible similar case previous to 1789, or say two cases in a century, merely illustrates the tendency of mankind to generalize from insufficient data. The progress of sound knowledge is hindered by adhering to a belief in such errors, but is fostered by awakening to the absolute necessity of a careful study of reliable statistics.

HYGIENE AND CLIMATOLOGY.

The relation between climate and disease is often treated of under the title of nosology, or the geographic distribution of disease, or the classification of diseases and climates. The modern expansive student of geography speaks of the geography of disease. In a recent publication by Prof. R. DeC. Ward[1] he treats this subject under the title "The hygiene of the zones". His article gives a brief survey of the relations between weather and climate on the one hand, and the more important diseases on the other. Twenty years ago, in view of the great advances then being made in hygiene, it may have been proper to say that, with suitable precautions, man can make any climate endurable. It has been shown that the spread of certain diseases is often entirely a matter of personal intercourse and contamination, so that neither the origin nor the spread of such diseases is due to climate directly, tho it may be so by reason of some indirect relationship. There are, however, certain potent climatic influences, and their study is as important to the whole community as it is to the medical profession.

The author discusses briefly the general effects of warmth and cold, high altitude and low, pure air, moisture and dryness, especially desert air, pure and aseptic; ocean air, pure and dust-free; winds, fogs and clouds, and sunlight.

Comparing old notions and new beliefs, Professor Ward says:

> The causation of disease is now no longer sought directly in meteorological conditions, but in the effects, more or less direct, of these conditions upon the micro-organisms which are the specific cause of the disease. Atmospheric conditions may help or may retard the development of the micro-organism, and may strengthen or weaken the individual's power of resistance against the attacks of the germ, as well as affect his susceptibility. Thus new views have replaced the old. Winds used to be regarded as the chief agents in spreading epidemics; now it is known that disease can not be carried far by winds, for the micro-organisms do not long maintain their power in the free air and under the sun. Rain has been supposed directly to control the distribution of diseases; now we believe that precipitation acts only indirectly, through drinking water, or through its control of the dust in the air. Dust from dry soil may contain the germs of infectious diseases, and aggravate affections of the respiratory organs. Harmful exhalations are no longer believed to be given off by the soil, but the condition of the soil as to moisture and temperature may affect the development and diffusion of certain micro-organisms. Some parallelism has been discovered between the prevalence of certain diseases, such as diarrhœa and typhoid fever, and soil temperatures or the ground-water level.

PALE GREEN SKY TINTS.

In Nature for January 24, 1907, page 295, Mr. Arthur W. Clayden of Exeter, England, gives the following explanation of the green tint often seen in that country in the sky during early twilight, but much more rarely seen in the sky at dawn. As these sky tints and colors are excellent indications of the condition of the air as to moisture, we hope that observers may be found here and there in America who have the instruments and leisure to make an accurate record of the location and intensity of the various tints. We have found the pale green closely associated with the delicate patch of pink or rose which is often seen above the sun after sunset and which is supposed to mark the presence of considerable vapor at a very high altitude in a very fine state of subdivision.

Mr. Clayden states:

> The color of the sky at any time is made up of two components: *A*, the light from the upper regions; *B*, that reflected from the small particles in the lower air. The *A* component is always blue, and its spectrum shows a deficiency in red and yellow rays. Its light passes between the particles of the lower air and therefore forms a background upon which they are projected. The spectrum of the *B* component is variable. When the sun is well above the horizon the light is white, and the variations in the deepness of the blue of a clear sky are due to differences in the relative proportions of *A* and *B*. As the sun nears the horizon the *B* light begins to lose its more refrangible rays, and the absorption extends toward the green and yellow as the sun goes down.
>
> Now if we take two equally brilliant spectra, cut the red, orange, and yellow from one and the violet and blue from the other, and then mix the residues we shall obviously have all the colors necessary to make white light with a double allowance of green. An eye receiving the whole will see pale green. This, I take it, is the origin of the green colors of the sky. The *A* component is deficient in the less refrangible rays, which are supplied by the *B* component, and the two spectra overlap in the green, showing an excess of that color.
>
> Occasionally, but rarely, the two are exactly complementary over a limited stretch of sky, and then white patches are seen amid the colors of the sunset which are easily distinguished from clouds. They shade off on one side into tints of green where the spectra overlap, into yellow where the *B* component is in excess, and into blue where the *A* light preponderates.
>
> When the sky is clear it is no uncommon thing to see a considerable expanse of green, shading on the one side into pale lemon-yellow where the overlap of the spectra is considerable, while on the other side it shades through a narrow border of silvery tint where the balance is exact into a delicate rosy hue where there is a general deficiency in the central rays.
>
> Green tints are by no means always to be seen, and I think the foregoing explanation shows why—their production depends upon such an adjustment between the brightness of the two components that they shall be approximately equal. The white patches are rarer still, as they require exact equality in brightness and correct apportionment of color.

The Editor has seen it stated that the extensive area of pale green in a clear sunset sky is due to the combination of the blue light that comes from the upper atmosphere and the rosy tint reflected by particles in the lower atmosphere, as blue and red combined give various shades of green; but if patches of white are also to be observed then this explanation fails and Mr. Clayden's becomes more probable. The whole subject of twilight colors was discust by Prof. Wilhelm von Bezold in a famous memoir on the twilight, published by him in 1864, in Poggendorf's Annalen, and reprinted a year ago in his collected papers (Gesammelte Abhandlungen, * * * W. von Bezold, Braunschweig, 1906).—EDITOR.

AERIAL EXPLORATION ABOVE THE OCEAN.

At the formal opening of the Scottish Oceanographical Laboratory, at Edinburgh, on Wednesday, January 16, 1907, the Prince of Monaco presided, and we quote the following from the account of his public address before the Royal Scottish Geographical Society, on the evening of January 17, as reported in Nature, January 24, vol. 75, p. 308:

> In the course of his address the Prince said that in the last few years the improvements in the manufacture of steel had made it possible to fly kites at great heights, carrying self-registering apparatus. Also the india-rubber industry has enabled balloons, carrying self-registering apparatus, to be sent to altitudes hitherto inaccessible. Through the liberality of the German Emperor a great establishment had been set up at Lindenberg for the systematic investigation of the upper-air meteorology. This was over the land. In 1904 the lecturer had become interested in the subject and he began to make plans for investigating the

[1] The Hygiene of the Zones, by Robert DeC. Ward, reprinted from the Bulletin of the Geographical Society of Philadelphia, Vol. IV, January, 1906.

problem over the sea. To reach great heights it was necessary to attach to the line or wire a series of kites at intervals, and if no layers of calm air were encountered a very great height could be reached, and the kite kept there by the vessel moving with a speed of not less than seven meters per second. There were many difficulties on board ship due to complications of wind distributions in the different layers. After a season's work with kites in the Atlantic the Prince resolved to try the sounding balloons. The method first adopted was to use two light india-rubber balloons filled with hydrogen. The one carried the self-registering apparatus, while the other and more inflated balloon was attached to it, and aided the ascent to the required height. At this height the upper balloon burst, and the lower balloon with its instruments descended as a balloon-parachute, and hovered over the sea so long as the float at the end of the stray line touched the surface of the water. This could be seen at a distance of 8 or 10 miles. The bursting of the balloon was somewhat indefinite and an improvement was subsequently effected, by means of which the one balloon was released altogether at the desired height. This was done by means of a current from a small dry cell set in action when the pen of the barograph on the lower balloon touched a conductor set at the pressure corresponding to the desired height. Also by use of a formula taken in connection with the observed ascent of the system, the line of descent of the balloon-parachute could be approximately calculated and the ship steered for the place. By means of apparatus of this kind pressure and temperature curves had been brought back from a height of 7500 meters in latitude 78° 55′. In the high latitudes the experiments had been greatly interfered with by fog. The drift of air in still higher regions had been studied by means of pilot balloons, which had been followed through the telescope of a theodolite to heights of nearly 30,000 meters. These indicated that in latitude 80° north, at a height of about 13,600 meters, there were at times winds blowing with a velocity of 60 meters per second, or 130 miles per hour. The results of several cruises had shown that "if the principal states of the world were willing to diminish a little the expense of international quarrels by submitting them to the judgment of a tribunal less costly than that of war, and if they preserved more resources for the veritable interests of humanity, it would be possible with powerful means very soon to know the laws of meteorology, the key to which seemed to be found in the higher atmospheric regions."

FOEHN IN NEW SOUTH WALES.

We are indebted to Prof. Mark Jefferson of Ypsilanti, Mich., for the following reference to a work by John Dunmore Lang, D. D., "An Historical and Statistical Account of New South Wales", London, 1837; vol. 1, page 267, being an account of the great drought of 1827–1829.

Professor Jefferson remarks that the text appears to refer to a foehn wind heated dynamically in its descent from the Blue Mountains to the lowlands on the upper Hunters River. The author does not, of course, recognize it as a foehn—his book is dated 1837—but refers its heat to the interior deserts. It is reported as particularly destructive in a period of three years of drought.

In the year 1828 the failure of the crop in the upper parts of Hunters River, and in certain other districts of the territory, was not attributable to the drought at all, but to blighting northwesterly winds. In the course of that season, when the settlers had a second time begun to despair of their crops, there was a copious and seasonable fall of rain, the almost instantaneous effect of which on the vegetation of the country was truly astonishing. The wheat crop immediately revived and hopes were universally entertained of an abundant harvest. Just, however, as the wheat had got into ear a northwesterly wind, blowing as from the mouth of a furnace, swept across the country and in one hour destroyed many hundred acres of highly promising wheat. As I had occasion to visit the district of Hunters River in the discharge of clerical duty, immediately after this calamitous visitation, I made a few cursory observations on the subject which I embodied in a paper, of which the following is an extract.

"The disease called *the blight* undoubtedly arises from the northwesterly winds, which occasionally blow from the arid regions of the interior of this continental island, and exert a most destructive influence on vegetation of every description wherever they extend. These winds prevail to a greater or less degree every season, but it is only in particular seasons like the present, when, from causes unknown to us, they acquire a higher temperature and blow for longer periods and with greater violence than in ordinary seasons that they prove fatal to vegetation and blast the hopes of the husbandman; and this result will doubtless be accelerated if, as unfortunately happened this season, the vegetation is of that peculiar character which it uniformly acquires in a warm climate when heavy rain succeeds a long continuance of drought".

After pointing out the value of wind-breaks, even of common rail fence to a limited extent, Doctor Lang goes on to point out the exemption of that part of the Hunters River country nearer the sea. He states that it appears:

That in that [coastal] part of the district the blighting influence of the northwest winds is almost entirely counteracted by the proximity of the ocean, and the consequent diminution of temperature which that proximity must occasion. This result, however, is not produced by the mere mechanical effect of the sea breeze, which generally alternates with the land wind along this coast during the summer months; for when the northwest wind blows with sufficient violence to occasion blight in the interior, there is no sea breeze on the coast: but the ocean not only cools the atmosphere above itself, but refrigerates the air, counteracts the noxious influence of the land wind, and promotes vegetation to the distance of about twenty-five miles on [*from*] the coast.

If it should be asked, however, why the districts of Bathurst and Argyle are less subject to blight than the upper part of Hunters River, it may be stated in reply that the Argyle country is two degrees farther to the southward, and consists in great measure of elevated table land, situated within a moderate distance of the coast. The plain of Bathurst, on the other hand, is 2000 feet above the level of the sea, while the upper part of the district of Hunters River is almost on a level with the ocean.

These last sentences seem to establish the foehn character of the wind, it being without injurious effect on the highlands—Bathurst and Argyle—because it is not there a descending wind. It would be interesting to know whether it has been observed since. The drought was believed to have been the greatest in a generation.

THE HEAVIEST LOCAL RAINFALLS IN CALIFORNIA.

In the climatological report of the California section for February, 1907, is published a list of California stations having very large annual rainfalls. Most of these occurred during the year 1906, but a few in 1904. Concerning this table Professor McAdie remarks that while these amounts are very large they do not break the record for the greatest annual rainfall nor the greatest monthly rainfall in the State—which were, respectively, 137.58 inches in 1902, and 62.24 inches in February, 1902, both at the station Helen Mine, Lake County. Professor McAdie gives credit to Mr. George H. Willson, Local Forecaster at San Francisco, for the preparation of this table:

Stations.	1906.	1905.	1904.	Normal.	Length of record.
Helen Mine	129.69	68.03	114.72	93.51	6
Woodleaf	125.41	.....	.....	.....	1
Stirling City	125.08	44.02	.....	.....	3
Magalia	125.01	48.16	94.40	.....	3
LaPorte	124.46	.....	.....	78.08	13
Fordyce Dam	120.64	43.16	.....	.....	.....
Monumental	116.13	69.30	.....	.....	2
Bear Valley (Nevada County)	110.85	46.93	103.59	.....	.....
Pilot Creek	110.61	42.56	93.99	.....	.....
Brush Creek	106.25	50.63	91.98	.....	3
Blue Canyon	104.21	46.65	93.48	64.05	8
Nimshew	104.00	43.11	.....	.....	3
Branscomb	99.08	55.03	115.07	93.48	7
Emigrant Gap	98.15	40.10	.....	51.72	33
Bowman's Dam	97.45	64.49	135.70	.....	.....
Summerdale	95.25	36.80	61.22	48.80	11
Tamarack	94.35	.....	.....	.....	1
Georgetown	93.22	35.77	79.37	57.10	34
Crockers	90.62	35.30	.....	.....	3
Grass Valley	87.22	.....	.....	.....	.....
Boulder Creek	86.36	43.78	67.51	.....	.....
Iowa Hill	85.72	33.42	67.87	52.19	26
Upper Mattole	85.70	70.04	126.49	81.66	19
North Bloomfield	85.32	41.74	73.60	53.52	10
Gold Run	85.24	32.22	76.20	51.26	8
Co fax	85.21	.....	70.59	46.64	36
Nevada City	82.72	36.91	68.64	55.79	15
Zenia	82.21	46.92	105.87	78.76	5
Ben Lomond	81.64	45.51	67.87	.....	.....
Mount Saint Helena	81.54	49.89	92.87	.....	5
Blocksburg	80.84	.....	.....	.....	3
Towle	82.14	43.23	.....	51.68	21
Delta	79.40	52.66	90.31	60.10	22
Laurel	79.06	38.00	64.87	.....	.....
Shasta	70.93	44.32	75.76	49.90	11
Crescent City	70.27	50.91	107.61	70.28	13
Fort Ross	69.77	49.63	85.38	50.70	14
Glenwood	69.25	.....	.....	.....	.....
West Point	68.58	26.07	58.20	.....	.....
Quincy	66.92	.....	61.42	43.15	12
Greenville	66.45	24.26	61.74	40.87	13
Felton	64.17	37.06	54.14	.....	.....
Mercury	62.93	42.54	73.11	.....	3
Butte Valley	62.26	48.90	86.00	.....	3
Cuyamaca	59.91	66.10	26.81	33.32	8

RECENT PAPERS BEARING ON METEOROLOGY.

H. H. KIMBALL, Librarian.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a ——

American monthly review of reviews. New York. v. 36. July, 1907.

—— A year of delayed harvests. p. 79–83.

Journal of geology. Chicago. v. 15. April–May, May–June, 1907.

Hobbs, William Herbert. The recent advance in seismology. p. 288–297, 396–409.

Physical review. Lancaster, Pa. v. 24. June, 1907.

Trowbridge, C. C. On atmospheric currents above fifty miles from the surface of the earth. p. 527–529. [Discussion of observations of meteor trains.]

Scientific American. New York. v. 96. June 29, 1907.

Gradenwitz, Alfred. A novel apparatus for demonstrating atmospheric pressure. p. 535.

Scientific American supplement. New York. v. 64. 1907.

Henriet, H. The atmosphere of cities. An investigation with a practical bearing on public health. (July 6, 1907.) p. 10–11.

Gradenwitz, Alfred. An aeronautical observatory; the elaborate equipment of a model observatory. (July 13, 1907.) p. 24–26. [Fully illustrated description of the observatory at Lindenberg, Prussia.]

Dibos, M. M. The artificial dispersion of fog; the solution of a municipal engineering problem. (July 13, 1907.) p. 30–31.) [Describes successful experiments with hot air jet and with Hertzian waves. Suggests applications to navigation and railroading.]

Symons's meteorological magazine. London. v. 42. June 1907.

—— Wilhelm von Bezold, 1837–1907. p. 83.

Archives des sciences physiques et naturelles. Genève. 4 pér. Tome 23. 15 juin 1907.

Perrot, S. de. Charges produites par la neige sur les toits. p. 609–610.

Ciel et terre. Bruxelles. 28 année. 1907.

Dobrowolski, A. Les cristaux de glace aériens et le phénomène des halos. (16 juin 1907.) p. 183–196.

Alippi, Tito. Sur un phénomène acoustique d'origine terrestre ou atmosphérique. (1 juillet 1907.) p. 209–219. [Discusses an extensive series of observations of "brontidi" (barisal guns; mistpoeffers) in Italy.]

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Maillard. Sur la trombe du 22 mai 1907 dans le département du Loiret. (Tome 144. 17 juin 1907.) p. 1392–1393.

Bloch, L. Sur l'ionisation de l'air par barbotage. (Tome 145. 1 juillet 1907.) p. 54–55.

Nature. Paris. 35 année. 29 Juin 1907.

Plumandon, J[ean] R[aoul]. La sécheresse de l'année 1906. p. 77–78.

Revue néphologique. Mons. Juin 1907.

—— Nébulosité à Davos 1904–1906. p. 137.

Bracke, A. Ballons piriformes contre la grêle. p. 142–144.

Annalen der Physik. Leipzig. 4 Folge. Bd. 23. 1907.

Warburg, E., and Leithäuser, G. Ueber die Oxydation des Stickstoffs bei der Wirkung der stillen Entladung auf atmosphärische Luft. p. 209–225.

Barkow, Erich. Versuche über Entstehung von Nebel bei Wasserdampf und einigen anderen Dämpfen. p. 317–344.

Beiträge zur Physik der freien Atmosphäre. Strassburg. 2 Bd. 3 Heft.

Rosenthal, Elmar. Ueber trockene Zonen der freien Atmosphäre. p. 79–91.

Bassus, K. v[on]. Ueber die Windverhältnisse in der oberen Inversion. p. 92–95.

Hergesell, Hugo. Die Erforschung der freien Atmosphäre über dem Polarmeer. p. 96–98.

Kleinschmidt, Ernst. Die Feuchtigkeitsmessung bei Registrierballonaufstiegen. p. 99–124.

Gaea. Leipzig. 43 Jahrgang. August 1907.

—— Eine Beobachtung des künstlichen Brockengespenstes. p. 462–465. [Review of paper by Richarz.]

—— Niederschlag, Abfluss und Verdunstung in Mitteleuropa. p. 465–472. [Review of work by H. Keller.]

Geographische Zeitschrift. Leipzig. 13 Jahrgang. 11 Juni 1907.

Sapper, Karl. Island. p. 225–243. [Climate p. 226–229.]

Himmel und Erde. Berlin. 19 Jahrgang. Juni 1907.

Hennig, Richard. Witterung und Weltgeschichte. p. 405–423.

Meteorologische Zeitschrift. Braunschweig. Bd. 24. Juni, 1907.

Börnstein, R. Aus Goethes Meteorologie. p. 241–247.

Becker, Aug. Zur Messung der Tropfengrossen bei Regenfällen nach der Absorptionmethode. p. 247–261.

Wundt, W. Ueber die Berechnung der Solarkonstante. p. 261–269.

Hann, J[ulius]. Zum Klima von Peru. p. 270–279. [Abstract and discussion of Bailey's Peruvian meteorology, pt. 2.]

Mihr, Fr. Zur Kenntnis der elektrischen Leitfähigkeit der Luft. p. 282–285.

Hann, J[ulius]. Resultate der meteorologischen Beobachtungen zu Lydenburg, Transvaal. p. 285–286.

Reale accademia dei Lincei. Atti. Rendiconti, Classe di scienze fisiche, matematiche e naturali. Roma. v. 16. 1 giugno 1907.

Marchi, Luigi de. La teoria elastica dell' isostasi terrestre. p. 910–916.

Monti, V. Di alcune possibili relazioni tra la sismicità della Svizzera e quella dell' alta Italia. p. 916–920.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

H. H. KIMBALL, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

Angström, Knut.

Méthode nouvelle pour l'étude de la radiation solaire. Upsala. 1907. 19 p. 4°. (Nova acta Regiæ societatis scientiarum upsaliensis, ser. 4, vol. 1, no. 7.)

Barnes, Howard T.

Ice formation, with special reference to anchor ice and frazil. New York, etc. 1906. x, 260 p. 8°.

Bavaria. K. meteorologische Centralstation.

Deutsches meteorologisches Jahrbuch, 1898. München. 1899–[1907]. v. p. f°.
Same. 1899. München. [1907.] v. p. f°.
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British rainfall organization.

Rules for rainfall observers, by Hugh Robert Mill. London. 1906. 7 p. 8°.

Ferle, Friedr. R.

Praktische oder angewandte Meteorologie für Landwirte; für Studierende der Landwirtschaft, Landwirte, Förster etc. sowie zum Selbstunterricht. Riga. 1906. 92 p. 8°.

Iakhontov, G.

Buri Ozera Baĭkal. [Storms of Lake Baikal.] St. Pétersbourg. 1906. 15 p. f°. (Mémoires de l'Académie impériale des sciences de St. Pétersbourg, 8e sér., v. 19, no. 3.)

Japan. Central meteorological observatory.

Annual report, 1905. Part 1. Meteorological observations in Japan. Japan. Tokio. 1906. 345 p. 4°.

Kerner, Fritz v[on].

Thermoisodromen; Versuch einer kartographischen Darstellung des jährlichen Ganges der Lufttemperatur. Wien. 1905. 30 p. 4°. (Abhandlungen der K. k. geographischen Gesellschaft in Wien, 6. Band, 1905, no. 3.)

Lowenthal, Jacques.

Ueber das Klima von Rostock, unter Berücksichtigung der harmonischen Analysis. Schwerin. 1906. 48 p. f°. (Inaug.-Diss.–Rostock.)

Meyers grosses Konversations-Lexikon.

Meyers grosses Konversations-Lexikon. Ein Nachschlagewerk des allgemeinen Wissens. Sechste, gänzlich neubearbeitete und vermehrte Auflage. Vol. 1–16. A–Rinteln. Leipzig, etc. 1904–1907. 4°.

Müller, Rudolf.

Ergebnisse zwanzigjährigen zu Gumbinnen von 1885-1906 angestellten meteorologischen Beobachtungen. Gumbinnen. [1907.] 91 p. 8°. (Beilage zum Jahresbericht der Königlichen Friedrichschule, Ostern 1907.)

Negro, Carlo.

Evaporimetro a riflessione. Pavia. 1906. 7 p. 8°. (Extr. Rivista di fisica, matematica e scienze naturali, Pavia, anno 7, aprile 1906, no. 76.)

Le scariche elletriche e la loro relazione con la pioggia. Pavia. 1907. 11 p. 8°. (Extr. Rivista di fisica, matematica e scienze naturali, Pavia, anno 8, febbraio 1907, no. 86.)

Sull' inversione della temperatura. Pavia. 1905. 15 p. 8°. (Extr. Rivista di fisica, matematica e scienze, Pavia, anno 5, luglio 1905, no. 67.)

Sull' altezza dell' aurora polare. Torino. 1905. 20 p. 16°. (Extr.

Bollettino mensuale della Società meteorologica italiana, no. 1-2-3, anno 1905.)

Rosenhainer, O.

Ergebnisse der meteorologischen Beobachtungen in Ilmenau, Weimar und Jena 1900-1906. Ilmenau i. Thür. [1907.] 22 p. 4°. (Wissenschaftliche Beilage zum Jahresberichte über die Städtische Realschule zu Ilmenau i Thür., Ostern 1907.)

Schwab, P. Franz.

Ueber die Schneeverhältnisse im Gebiete von Stoder. Nach den Beobachtungen des Oberlehrers J. Angerhofer. Linz. 1907. 70 p. 8°.

Semenov, I.

Sieverovostochnyia buri Chernago i Azovskago morei. [Northeast storms of the Black and Azof Seas.] St. Pétersbourg. 1906. 37 p. f°. (Mémoires de l'Académie impériale des sciences de St. Pétersbourg, 8e sér., v. 19, no. 5.)

Smith, Arthur G.

Evaporation upon the Iowa River. (*In* Contributions from the physical laboratory of the state university of Iowa, v. 1, no. 1, p. 15-24. Iowa City. 1907.)

Sonnblick-Verein.

Fünfzehnter Jahres-Bericht für das Jahr 1906. Wien. 1907. 65 p. 4°.

Voeikov, A.

La variabilité interdiurne de la pression atmosphérique principalement en Asie. St. Pétersbourg. 1906. 40 p. f°. (Mémoires de l'Académie impériale des sciences de St. Pétersbourg, 8e sér., v. 19, no. 6.)

EDUCATIONAL NOTES.

Interesting announcements regarding instruction in meteorology at Harvard University will be found in the prospectus of the division of geology, issued in pamphlet form June 20, 1907, as number 24 of Volume IV of the Official Register of Harvard University.

Geology B is the elementary course in meteorology, and is required for admission to all the courses in climatology. It counts as a half course, is given during the second half year, and includes three lectures and four hours of laboratory work each week. It is open to freshmen.

Geology 1 deals with the climatology of North America. It is a half course, given during the first half year, and includes three lectures each week and additional hours for laboratory work. It is designed to give a general view of the climates of North America especially suited to the use of students of physiography, forestry, and medicine.

Geology 2 is a half course on the geography of South America, given during the first half year. Assistant Professor Ward is the instructor, and special attention is paid to climatology.

Geology 3 (omitted in 1907–8) treats of the climatology of the Eastern Hemisphere.

Geology 19 is a half course in general climatology, given during the first half year. It includes three lectures each week and additional hours for laboratory work. It is recommended to students who intend to study medicine. The textbook is the English translation of Volume I of Hann's Handbuch der Klimatologie.

Geology 20e is a research course in climatology, primarily for graduates. It may be taken as a whole course or as a half course, but is open only to those who have past in all or most of the courses previously mentioned or who have had equivalent preparation.

In regard to the geographical and meteorological laboratory the pamphlet announces:

A large corner room on the third floor (of the geological section of the university museum building) is devoted to the elementary classes in physiography and meteorology, and is provided with tables for about forty men. Adjoining this room are two smaller rooms used for lectures before advanced classes.

As an adjunct to the meteorological laboratory, there is a students' meteorological observatory. This observatory, equipped for the practical instruction of students, is established on the roof of the geological section of the museum, with an instrument room immediately below.

Mr. H. L. F. Morse, head of the department of science in the Troy, N. Y., High School, informs us that at that school considerable attention is given to the study of meteorology. In the physics classes, numbering in all about fifty pupils, as much time as possible is spent on meteorology, under the heads of barometry, thermometry, and heat propagation. Some of the pupils get interested and pursue meteorology by themselves, following along from the weather map that comes to the school each afternoon.

In the physical geography class, numbering from forty to fifty pupils, each pupil makes, on transparent paper, a diagram from some dozen or more "lows" on the same piece of paper, each set of arrows being superposed on all the others. Also a similar diagram is prepared from a dozen "highs." From several sets of consecutive maps storm paths are traced across the continent. Each pupil makes a complete weather map from the telegraphed data. During a month in the fall and again in the spring the pupils take daily turns in reading the barometer and thermometers (dry and wet bulbs, maximum and minimum), and noting the wind direction and weather, and during these periods the weather of each day is discust in class for fifteen minutes, the pupils finding the cause from the map of the day itself or that of the preceding day.

Most of the boys and some of the girls in this class become very good forecasters, and scarcely need to look at the predictions on the maps received from Albany.

DISSEMINATION OF USEFUL KNOWLEDGE.

The Secretary of Agriculture has been informed of the following resolution recently adopted in London:

That the members of the International Conference on Hybridization and Plant Breeding, gathered from all parts of the world, and assembled in the hall of the Royal Horticultural Society of Great Britain, desire to express to the President of the United States of America, and to the Minister of the Department of Agriculture at Washington their hearty appreciation of and thanks for the invaluable assistance which has been given to farmers, horticulturists, planters, and scientific men throughout the whole world by the liberal distribution of American research publications.

As our Government has sometimes been criticized for its efforts to disseminate useful knowledge, it is a pleasure to receive such hearty appreciation and recognition of its work. If the knowledge acquired by research at the expense of the people can be widely disseminated and made available in many practical ways, then civilization is advanced, the permanent security of the Government is assured, and an additional argument is offered for the wisdom of our forefathers in establishing a government of the people, by the people, and for the people.

METEOROLOGICAL TERMS USED IN THE PHILIPPINES.

Under date of December 23, 1906, Capt. John P. Finley, Governor of the District of Zamboanga, submits a list of native names of certain meteorological terms. This list is given in English, Maguindanao Moro, Sulu Moro, Malay, and Spanish. The Maguindanao Moro is given in both English and Arabic characters.

We regret that, not having a font of Arabic characters, we can print the Maguindanao Moro only in English characters.

As a general rule the number of specific terms applicable to specific weather conditions indicates the extent of the national habit of a close consideration of the atmosphere in its relation to the every-day occupations of the people. Among some nations it is the rain, among others the wind, and among others still the sunshine that most frequently attracts attention. It is specially interesting to find words for ice and snow coined by people who certainly very rarely, if ever, become acquainted with these in a natural way in such a tropical climate as that of the Philippines.

List of certain meteorological terms used in the Philippines.

English.	Maguindanao Moro.	Sulu Moro.	Malay.	Spanish.
White clouds	Gabun a maputi.	Andum puti.	Awan puti	Nubes blancas.
Dark clouds	Gabun a maytūm or (Rūndūng).	Gabun	Awan itam	Nubes oscuras.
High clouds	Gabun a mapuru	Awan Mata'as	Awan tinggi	Nubes elevadas.
Low clouds	Gabun a mababa	Awan hababa'	Awan randah or rendah	Nubes bajas.
Clouds	Gabun.	Awan.	Awan.	Nubes.
Fog	Lūkūp.	Gabun.	Kabut	Niebla.
Rain	Uran	Ulan	Hujan	Lluvia.
Heat	Kayaw	Pasu	Panas	Calor.
Cold	Kat inggaw.	Haggut	Sejuk	Frio.
Rainbow	Bulutu or tupung	Inak	Plangi	Arco iris.
Storm	Ribut or Subu-subu	Hunus or unbak Tawpan	Ribut	Tormenta.
Thunder	Ruggung	Dawug-dug or Daug-dug	Guroh	Trueno.
Lightning	Kilat	Kilat	Kilat	Relampago.
Wind	Undu'	Hangin	Angin	Viento.
Snow or hail	Uran-watu	Ulan batu	Thalj (Ar.)	Nieve ó granizo.
Ice	Ig-a-watu	Tubig-batu	Ayar baku	Hielo.
Moisture	Magbasa or Musa	Basa'	Lengas	Humedad.
Current	Margus Ig	Sug	Arus	Corriente.
Kite	Layang-layang	Taguri	Layang-layang	Cometa.
Waterspout	Subu-subu'	Buhawi	Puting blion	Manga Marina.
Whirlwind	Ripurus	Ayimpus or Aimpus	Angin Puting blion	Remolino.
Sunlight	Sigay	Sawa	Trang	Luz del Sol.
Darkness	Kalibutung	Lindom	Glap	Oscuridad.
Moon	Ulan-ulan.	Bulan	Bulan	Luna.
Sun	Snang	Suga	Mata hari	Sol.
Star	Bitun	Bit'un	Bintang	Estrella.
Weather (day)	Gay	Adlaw	Musim	Tiempo.

WEATHER BUREAU MEN AS EDUCATORS.

The regular course of instruction in meteorology at the University of Missouri, at Columbia, was given this year by Mr. George Reeder, section director. The duration covered the entire second semester. The class consisted of medical, agricultural, and engineering students in about equal number, in all about thirty, and was divided into four sections. Charts, photographs, lantern slides, and especially blackboard diagrams were used. References were made to the books by Davis, Waldo, Hann, and Ferrel; to Bartholomew's Physical Atlas, Volume III, and to the publications of the Weather Bureau. Observations, written exercises, and laboratory work, including the making of weather maps and forecasting, were required. The final examination was sustained in a very creditable manner, and great interest was taken in the entire course.

During the past year Mr. Reeder has delivered several special lectures outside of the regular course. The most important of these were one on "Meteorological instruments and their uses", to a body of visiting State teachers, and one on "Clouds" (illustrated), to the Society of Senior and Junior Engineers of the university.

The set of lantern slides illustrating the work of the Weather Bureau and the accompanying lecture prepared by Mr. John R. Weeks, of the Binghamton, N. Y., office, had, up to June 12, been exhibited and given in twenty places. In many of these they have been used in several schools, or schools have united in their use. The lectures have been open to the public, and have usually been announced in the local papers. Nearly thirty other requests have been received, which it is hoped to comply with during the next school year.

According to The Laurentian, the organ of the students of St. Lawrence University, Canton, N. Y., the honorary degree of master of arts was conferred upon Merton Leonard Fuller, of the United States Weather Bureau. Mr. Fuller has been in charge of the local weather station during the past year, and has also served the university as a lecturer on meteorology and climatology. He has won the esteem of all who know him and made many friends, and the action of the trustees in conferring this degree was a matter of general congratulation.

Under date of July 23, Mr. Fuller reports as follows relative to his educational work during the past year:

In St. Lawrence University an elective course in meteorology, three hours per week, open to junior and senior classes, was continued thruout the year. The first semester was devoted to meteorology, using a part of Davis's text as a basis; the second semester to a course of lectures on general climatology, with student reports and laboratory work, using as a foundation a number of official and standard works. Final examinations were given at the end of each semester and past by every student. The number of students electing the course increased materially for the second semester, during which period the class enrolled nearly one-fourth of all those eligible to the work, and more than one-seventh of the entire enrollment of the university, excepting, of course, that portion of the university not located at Canton. The class in physiography taught during a part of the second semester is not included in any manner in the statements of this letter.

For the lectures of the second semester over 500 slides were used, fully half of which are now a part of my personal equipment for future work. In my personal equipment is also a Thompson combination reflectoscope and lantern, by which drawings or photographs may be thrown directly upon the screen without the need of slides, and supplementary use was made of this method.

Most of the slides in my personal stock were made to order for the work of the semester. They were prepared from original material, or taken from Weather Bureau Bulletins P and Q, Bartholomew's Physical Atlas, Vol. III, the MONTHLY WEATHER REVIEW, or from various other works in the station library or loaned by the Central Office. Weather Bureau Bulletin Q and Bartholomew's Atlas were especially valuable sources, and were extensively drawn upon.

In addition to the work at St. Lawrence University was the course of seventeen or eighteen lectures given at Potsdam, N. Y., during the second semester, in connection with which a class of nine students of Clarkson School of Technology (one of the original ten having left school) received one hour's credit for the lectures, collateral reading, and examination.

There were also during the winter and spring two lectures before teachers' institutes and three before farmers' institutes, some of which, it is thought, were previously reported.

Besides the foregoing, considerable has been done on a personal card index for use in meteorological educational work. This now covers nearly all the station library and selected subjects in the large university library, and is already of valuable service.

The following lectures and addresses by Weather Bureau men have been reported:

Mr. H. F. Alciatore, May 4, 1907, before the Little Rock, Ark., High School, also May 28, before the Railroad Young Men's Christian Association, Argenta, Ark., on "The work of the Weather Bureau".

Mr. J. Warren Smith, June 20, 1907, before the Franklin County Pioneers' Association, at Westerville, Ohio, on "The making of weather forecasts".

Mr. R. H. Sullivan, June 6, 1907, at the outdoor meeting of the Sedgwick County Horticultural Society, near Wichita, Kans., on "The history, methods, and benefits of the U. S. Weather Bureau".

Mr. A. B. Wollaber, July 1, 1907, before a gathering of the graduates of Pomona College, at Los Angeles, Cal., on "The work of the Weather Bureau and the methods employed in forecasting".

Classes from universities, schools, and colleges have visited the Weather Bureau offices to study the instruments and equipment and receive informal instruction, as reported from the following stations:

Chicago, Ill., January 23, 1907, pupils of the Lake High School; March 23, 1907, pupils of the Central Young Men's Christian Association, of Chicago; March 27, 1907, pupils of the Chicago Normal School; March 30, 1907, pupils of the Lake View High School; April 9 and 11, 1907, pupils of the Thomas Hoyne High School; April 17, 1907, pupils of the South Chicago High School; April 20, 1907, 18 teachers of the Chicago schools; April 29, 1907, pupils of the Hyde Park High School; May 15, 1907, pupils of the Thorp School, South Chicago; June 1, 1907, pupils of the Evanston Township High School, Evanston, Ill.; June 20, 1907, pupils of the J. Sterling Morton High School, Clyde, Ill.

Columbus, Ohio, June 1, 1907, a class in geology from Ohio State University.

Grand Junction, Colo., June 8, 1907, a class from the local School of Journalism.

New Orleans, La., June 6, 1907, a class from the Newman Manual Training School.

San Diego, Cal., June 13, 1907, the physical geography class of the San Diego State Normal School.

Syracuse, N. Y., June 5, 1907, a class from the Syracuse High School.

Vicksburg, Miss., May 29, 1907, part of the junior and senior classes from the Walnut Street High School.

CONFOUNDING CAUSE AND EFFECT.

The following remarks, quoted from the New York Times of June 28, 1907, forcibly repeat the remonstrance which was long since published in the MONTHLY WEATHER REVIEW, but which can not be too often reiterated:

Our first brief "spell" of hot weather ended Wednesday evening, as such "spells" usually do, with a thundershower. Thereupon everybody said, "The storm has cooled the air", just as everybody panting in the heat and humidity had said before the storm came that when it did arrive it would have that highly desirable effect.

And yet there is not, as a matter of fact, the slightest reason for thinking that thunderstorms ever did or ever will "cool the air" or otherwise in any degree change what we call "the weather". These little tempests are an effect of the cool wave, and not at all its cause, for they are produced, in a way fairly well understood, just at the point where a wave of cool air overtakes a hot and humid wave as the two leisurely take their way across the continent; and they are merely a symptom of the final struggle between the two.

It seems as if it would be easy to keep this sequence of events in mind, once it had been learned, and this one has been explained often enough; but habits of speech, inherited from innumerable prescientific days, are hard to break, and for centuries to come, probably, people and newspapers will continue to credit thunderstorms with bringing a relief as little the work of the storms as it is the work of the newsboys who sell the papers announcing the amount of rain that fell. Even the professional weather observers continue to use the old, wrong phrases; at any rate, the reporters quote them as using those phrases, and we have yet to hear of any protests from the Bureau men.

THE ST. SWITHIN'S DAY FALLACY.

By J. H. MORRISON. Dated Brooklyn, N. Y., June 14, 1907.

The legend of St. Swithin relates that he died in 862, and was buried on the north side of the church at Winchester, England. Many years later, on July 15, when his body was to have been disinterred and buried again inside the walls of the church, excessive rains occurred, continuing for 40 days, whence the saying that if rain falls on July 15 it will continue to fall every day, more or less, for 40 days following. The idea of this 40 days' rain in England was brought to America in colonial days, and is still current in many parts of the country.

Meteorologists have examined the rainfall statistics of Great Britain and have shown that there are no forty successive days of rain after July 15, and, in fact, no apparent connection between the weather of that date and the 40 days following[1]; but I know of no special study of the subject based on records for this country.

The early meteorological records of the United States are somewhat incomplete, but from a record kept of observations made by Prof. Parker Cleaveland of Bowdoin College at Brunswick, Maine, and published by the Smithsonian Institution, we are able to obtain the number of days of rain at that station for the full months of July and of August from 1808 to 1859. For this period of 51 years the average number of days of rain during the whole month of July was 7.1 days, and for the month of August 6.7 days. The highest number of days in July when there was rain was 13 in 1808, and the same number in 1828, and in August there were 13 days in 1812 and the same number in 1826. The greatest precipitation at this station was in August, 1843, when there fell 12.21 inches, and the next was in July, 1845—8.67 inches. The average rainfall for 31 years for July was 3.65 inches and for August 4 37 inches.

The record of observations made by Dr. S. P. Hildreth at Marietta, Ohio, from 1818 to 1859, as published by the Smithsonian Institution, is not full, but it shows that for a period of 32 years the greatest number of days of rain for July was 18 days in 1831, and 16 days in 1848. The month of August does not show such a wide range of days of rain, there being 4 years of 11 days each, 4 years of 10 days each, and 5 years of 9 days each. The average number of days of *no rain* during this period, by this record, was for July 21.9 days, and for August 21.7 days. The annual average of days of rain for the 32 years was for July 8.3 days, and for August 7.6 days. The greatest monthly precipitation during the two months was in July, 1831, 12.12 inches.

The data from the two preceding stations being from *monthly* records of the observations are not so valuable as desired for the purpose of this paper, still they show that there was not one year when 40 days of rain took place at the stations during the period.

The most valuable study for this country that can be made of the weather during the 40 days succeeding St. Swithin's Day is that from the tables of the daily precipitation prepared especially by the writer for this paper from the official records of the United States Weather Bureau in New York, and those of the meteorological observatory in Central Park, New York. This is the first time that this period of weather has been so covered. There are some advantages to be obtained from the comparisons of these records, tho they are not for the same period of time; for the meteorological observatory table covers 36 years, while that of the United States Weather Bureau is for 35 years. These stations being comparatively so short a distance apart, 4.8 miles in a nearly north and south direction, and in the charge of trained observers of

[1] See Prof. W. W. Bryant: The St. Swithin's Day Tradition. The Observatory, November, 1904. Symons's Meteorological Magazine, October, 1904, vol. 39, page 175.

the weather, these tables have much value in a paper on this subject, so far as our climate is concerned.

An analysis of these tables shows the following results:

Rainfall on St. Swithin's Day and during the 40 days following at United States Weather Bureau station, New York, N. Y.

Year.	Precipitation on July 15.	Days with rain.	Days with no rain.	Days with trace of rain.	Rainfall in 40 days.
	Inches.				*Inches.*
1872	2.33	16	24		11.87
1873	.00	23	17		10.24
1874	.00	12	28		3.47
1875	.00	23	17		14.91
1876	.00	14	24	2	6.71
1877	.00	15	24	1	4.30
1878	.00	15	24	1	9.37
1879	.00	14	25	1	6.45
1880	.36	13	26	1	5.59
1881	.00	8	28	4	1.97
1882	.00	7	30	3	1.03
1883	.40	13	25	2	3.63
1884	.00	16	22	2	7.47
1885	.00	10	27	3	6.38
1886	.02	15	22	3	2.87
1887	.00	19	19	2	8.67
1888	.00	14	23	3	6.95
1889	.89	18	20	2	10.96
1890	T.	15	17	8	6.14
1891	.07	20	15	5	4.92
1892	.00	12	25	3	2.49
1893	.00	13	25	2	3.99
1894	.25	14	24	2	2.22
1895	.00	14	21	5	5.39
1896	.00	19	20	1	5.17
1897	.06	24	11	5	7.61
1898	.00	16	15	9	4.84
1899	.00	15	17	8	5.86
1900	.03	14	21	5	4.17
1901	.00	16	18	6	5.67
1902	.27	19	16	5	5.96
1903	.00	17	19	4	5.74
1904	.00	17	18	5	8.87
1905	.01	16	21	3	6.11
1906	.01	16	22	2	5.07
Total	4.70	542	750	108	212.76

Average number of days of rain in the period of 40 days during 35 years, 15.48 days.

Average number of days of rain in the period of 40 days during 35 years, with days of traces of rain included, 18.54 days.

Average number of days of no rain, 21.42 days.

Average rainfall for 40 days, 6.08 inches.

The four years of greatest precipitation during these 40 days were 1872, 1873, 1875, and 1889. In both 1872 and 1889 the 15th of July was a wet day, having a rainfall record of 2.33 inches for the first and 0.89 inches for the latter year, while 1873 and 1875 had dry days on July 15. The proportion of dry and wet days for July 15 in 35 years is 22 dry days to 13 wet days. In 1873 there were 8 wet days in July and 15 wet days in August, and in 1875 there were 8 wet days in July having a precipitation of 4.49 inches, and 15 wet days in August with a rainfall of 10.42 inches. This was the year, during the period of 35 years, when the greatest rainfall took place in the 40 days, and next to the highest number of days of rain, exclusive of the days when "traces" were recorded. In 1889 there were 8 wet days in July and 10 in August having a total precipitation of 10.96 inches. The days of greatest precipitation were July 26, 1872, when there was a rainfall of 3.80 inches; August 12, 1875, with a rainfall of 3.34 inches; and July 27, 1889, with 2.77 inches. There were in the 35 years, during this special 40-day period, 3 days in July and 8 days in August when the daily precipitation ranged between 2.06 and 2.45 inches.

Average number of days of rain in the 40 days during 36 years, 14.03 days.

Average number of days of no rain in the 40 days during 36 years, 25.97 days.

Average rainfall for 40 days, 6.34 inches.

There were on July 15 11 wet days and 25 dry days during the 36 years.

The record of the Central Park Observatory shows:

Rainfall on St. Swithin's Day and during the 40 days following at Meteorological Observatory, Central Park, New York, N. Y.

Year.	Precipitation on July 15.	Days of rain.	Days of no rain.	Rainfall in 40 days.
	Inches.			*Inches.*
1871	.02	17	23	6.55
1872	1.57	18	22	10.11
1873	.02	19	21	11.01
1874	.00	8	32	3.29
1875	.00	19	21	12.86
1876	.00	10	30	4.90
1877	.00	13	27	6.22
1878	.00	15	25	9.59
1879	.00	12	28	9.13
1880	.34	11	29	6.92
1881	.00	8	32	1.09
1882	.00	5	35	.60
1883	.69	10	30	2.90
1884	.00	15	25	6.56
1885	.00	11	29	5.73
1886	.01	16	24	2.77
1887	.00	17	23	7.55
1888	.00	14	26	8.67
1889	.89	19	21	13.95
1890	.00	17	23	6.96
1891	.05	16	24	5.37
1892	.00	13	27	4.08
1893	.00	10	30	5.48
1894	.04	13	27	1.94
1895	.00	15	25	5.83
1896	.00	15	25	6.32
1897	.00	20	20	6.75
1898	.00	16	24	4.46
1899	.00	15	25	5.19
1900	.06	11	29	4.96
1901	.00	14	26	6.03
1902	.31	17	23	9.48
1903	.00	13	27	6.52
1904	.00	18	22	9.92
1905	.00	13	27	5.02
1906	.00	12	28	3.39
	4.00	505	935	228.10

On July 15, 1872, there was a rainfall of 1.57 inches, and during that period of 40 days there was a precipitation of 10.11 inches; while the next year on July 15 there was a rainfall of .02 inch, and a total for the following 40 days of 11.01 inches; and in 1889 there was a rainfall on the first day of the period of .89 inch, and a rainfall for the 40 days of 13.95 inches. These periods show the greatest number of wet days, with two exceptions, during the 36 years.

Then we find there was a dry July 15 in 1875, when there was a rainfall for the 40 days of 12.86 inches; then for 10 years following there were 8 years each having a dry opening day, when the precipitation for the 40 days ranged from 0.6 inch to over 9 inches. There were two dry periods in succession, both having dry opening days, that of 1881 with but 8 wet days, and 1882 with but 5 wet days out of the 40. These periods had the least precipitation of any of the years under review. Then for the next 24 years there was but one period when there was a rainfall of over 10 inches, and only two others of 9 inches each, in the 40-day period. For the 17 years following the year of the period of greatest rainfall, 13.95 inches, there has been a much lower average of rainfall during the period than that for the previous 19 years.

To show that the same percentage of rainy and rainless days, on an average, would occur for an extended period of time, viz, 40 days, at another season of the year than the St. Swithin period, an examination of the record to the present year for 38 years, from February 21 to March 31,—these two months showing the highest average of precipitation for an extended period of years, next to July and August—was made and indicated that out of 1491 days there were 557 days on which there was rain, and 934 days on which there was no rain, giving an average for the period from February 21 to March 31, inclusive, of each year, of 14.66 days on which there was rain, and 24.58 days of no rain. It is thus apparent that the same general average of dry and wet days holds good during another season of the year in this climate at least.

An analysis of the prominent records on the subject shows that the average number of days of rain in the 40-day period of St. Swithin is for Greenwich 18.85 days, for Dumfries 22.2

days, for U. S. Weather Bureau at New York 15.48 days, and for Meteorological Observatory at New York 14.03 days. It will be seen by these figures that there is a greater number of days of rainfall at the two stations in the British Isles than there has been at New York, and a much wider range of the number of days, whereas the records in the city of New York show that there is a less number of days, and the number of days is very limited in its range. These figures should efface from the card of probabilities this superstition of St. Swithin's Day so far as the climate of the United States is concerned. Altho the records of the climate of Great Britain show a larger number of days of rainfall there than in the city of New York, yet the old legend should receive the same favor there as in this country. It seems to be almost useless to say anything further regarding the absurdity of this old superstition, with such an array of telltale figures all set against the legend.

It has been suggested that the greater precipitation at our southern coast cities would show a much higher average than at New York, if it did not show that the old legend would at times hold good; but an examination of the records of two of the southern weather stations shows that the higher average during the period is of no moment, and that there has never been a year when there were 40 successive days of rain after July 15.

THE "SANTA ANA" OF CALIFORNIA.

The dust storms of the San Gabriel Valley are described by Prof. George E. Hale in the following quotation from his report in the Annual Volume for 1906, of the Carnegie Institution of Washington:

> I have previously alluded to the dust storms which sometimes enter the San Gabriel Valley thru the Cajon Pass from the Mojave Desert, and those much rarer storms in which the dust is carried by the wind completely over the Sierra Madre Mountains. In the more common form of dust storm (the so-called "Santa Ana") the dust enters the valley in a fairly well-defined mass and proceeds westward along the canyon of the Santa Ana River. In approaching the coast it spreads over a large area and diffuses itself with tolerable uniformity thru the lower atmosphere. I have seen from Mount Wilson a dust storm in the region of Riverside which in twenty-four hours had spread itself over Los Angeles and Pasadena. When it reached this part of the valley there was almost no wind, and the dust seemed to diffuse itself thru the air. Such storms sometimes completely hide the Sierra Madre Mountains from observers in Pasadena. Fortunately they are almost always confined to the lower atmosphere, and do not appreciably affect the transparency of the sky above Mount Wilson, where daily observations show that the transparency of the day and night sky are very satisfactory.

STANDARD TIME.

According to the Monthly Notices, Royal Astronomical Society, February, 1907, the standard time used in India since July 1, 1905, has been five hours and thirty minutes fast on Greenwich time; that of Burma is six and a half hours fast, but the time ball of the Colaba Observatory, Bombay, which is about 73° east of Greenwich, drops daily at exactly 3 a. m., Greenwich time, or about 8 a. m., local time. The Council at Port Louis, Mauritius, has decreed that from and after January 1, 1907, the standard time for that colony and its dependencies shall be that of the meridian 60° east of Greenwich. (The longitude of Mauritius is about 58°.) The standard for the Seychelles is also four hours fast on Greenwich time; but the standard for the Chagos Archipelago is five hours east of Greenwich. These regular hour standards are convenient for local use in many respects; but when it comes to interchange of meteorological data by cable and wireless, as well as by the ordinary telegraph and telephone, it would seem that the time must soon come when the world will find it best to adopt the Greenwich time uniformly. We do not, ourselves, appreciate the necessity for having, in India and the ocean south of it, four different standards (four, five, five and a half, and six and a half hours from Greenwich). The inconvenience of an irregular and arbitrary system of standards is appreciable, tho of course not to be compared with the confusion that existed before any standard was adopted. We fear that the subdivision into half and quarter hours will do more harm than good.—EDITOR.

PENALTY FOR COUNTERFEITING FORECASTS.

The Agricultural appropriation bill for the fiscal year ending June 30, 1906 [Statutes at Large, vol 33, part 1], contained the following legislative item:

> Any person who shall knowingly issue or publish any counterfeit weather forecasts or warnings of weather conditions, falsely representing such forecasts or warnings to have been issued or published by the Weather Bureau, or other branch of the Government service, or shall molest or interfere with any weather or storm flag or weather map or bulletin displayed or issued by the United States Weather Bureau, shall be deemed guilty of a misdemeanor, and, on conviction thereof, for each offense, be fined in a sum not exceeding five hundred dollars, or be imprisoned not to exceed ninety days, or be both fined and imprisoned, in the discretion of the court.—(See Act of Congress approved March 3, 1905.)

EQUINOCTIAL STORMS.

By Prof. E. B. GARRIOTT.

The term "equinoctial storms" has for centuries been applied to storms that happen near the spring and autumn equinoctial periods. Like many other popular impressions regarding imperfectly understood natural phenomena the general idea had its origin in observed facts. The difficulty in this case has been that the facts concerning the character and seasonal and geographical limits of storms that are associated with the equinoxes have given way to fancy. The rainy season of the Tropics, and the storms of the middle latitudes that occur in the spring and fall, have been confused with the severer storms known as hurricanes, cyclones, and typhoons that are experienced in the tropical and subtropical regions and even in the middle latitudes in certain seasons of the year.

The rainy season of the Tropics, which is entirely distinct from the season of equinoctial storms, attends the annual march of the sun over the equatorial regions. When the sun in its northward journey crosses the imaginary line of the equator the rainy season sets in over the northern equatorial region, and the rain belt keeps pace with the northward movement of the sun until the time of the summer solstice, about June 21, when the sun reaches the point farthest north in its course. About that time the rain belt reaches into the northern subtropical regions, like Florida, and the rainy season begins in those regions. In tropical countries, like the Isthmus of Panama, there is usually a short, dry season in the interval following the northward movement of the rain belt and its return southward with the sun. The characteristics of the rains of the Tropics are controlled largely by geographical and topographical features. They come in the form of local thunderstorms that are often attended by torrential rains and sometimes by severe wind squalls. Their occurrence is usually confined to the afternoon and the early portion of the night.

The season of severe tropical, or equinoctial, storms in the Northern Hemisphere, and more especially in the tropical and subtropical North Atlantic Ocean, does not begin until the sun has about half completed its return course to the equator. They occur near the time of the autumnal equinox, and their season extends from August to October, inclusive. In the North Atlantic Ocean these storms are called hurricanes, in the Indian Ocean, cyclones, and in southeastern Asiatic waters, typhoons. In the Pacific area the typhoon season begins earlier and continues later than the hurricane season of the North Atlantic Ocean.

At first sight it appears that astronomical events that forerun by several weeks meteorological phenomena can not be associated with those phenomena in the relation of cause and effect. Meteorological changes and conditions, due to astronomical causes, do not necessarily coincide in time of occur-

rence. The greatest heat of a summer's day does not occur when the sun is on the meridian, nor is the greatest heat of summer experienced in the middle latitudes of the Northern Hemisphere when the sun has reached the northern limit of its course.

If, therefore, the term "equinoctial storms" is to be preserved, and it undoubtedly will be, it may properly be employed to designate tropical storms, or hurricanes, cyclones, and typhoons, that occur in the Northern Hemisphere during the six or seven weeks that precede and follow the autumnal equinox. Many such storms may follow in rapid succession; each is *an* equinoctial storm. There is no one special storm to which the term "*the* equinoctial" should be applied.

SPECIAL CLOUD OBSERVATION.

An esteemed correspondent at Cunningham, Itasca County, Minn., Mr. David Rose, under date of December 8, 1906, states that at 11 a. m. of Friday, December 7, he "observed a clear rift of cloudless blue sky from the southern horizon thru the zenith to the northern horizon. On each side of this rift the clouds lookt like waves dashing against a rough beach." In reply to his query as to the cause and nature of this phenomenon the following letter has been sent. It would scarcely seem worth while to publish this reply were it not that so many persons are liable to make the mistake of assuming that some unknown mysterious electrical influence controls the formation of clouds, whereas the fact is cloud forms are produced by condensation of moisture under a myriad of complex conditions as to temperature, humidity, and wind, and it is these conditions that determine the nature of the cloud. If any electricity is developed in the formation of such a cloud it is a matter of very little consequence in comparison with the winds and the moisture, the barometric gradient, and the temperature gradient. Dynamic meteorology consists essentially in the study of the hydrodynamics and the thermodynamics of the atmosphere; the optical and electrical phenomena are matters of minor importance in relation to winds, storms, and weather, but they should be carefully studied by those who are expert in these matters.—EDITOR.

The weather map shows that on the morning of Friday, December 7, you were located on or near a narrow belt separating a region of cold westerly winds, which lay to the east of you, from a region of warmer southeast winds, which lay to the west of you. This latter region had disappeared by the morning of Saturday, December 8. I therefore infer that the clear, blue sky that you saw extending in a narrow band northward and southward was a region in which air was descending slowly, so that it might flow, some to the east and some to the west, toward these two regions of westerly and easterly winds, about as shown in this little sketch. In this case you would not be likely to feel any very

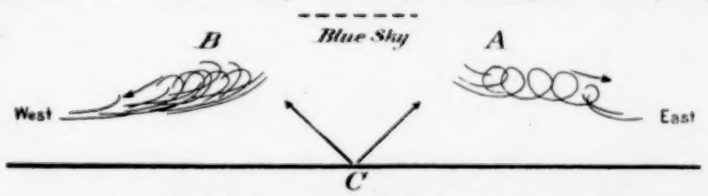

FIG. 1.—Vertical section thru clouds and clear rift.

strong winds, as the descending air would flow to the east or west before it reached the ground. However, the air rarely flows in straight lines, and these winds would undoubtedly roll over and over, forming belts of clouds at *A* and *B*, while the space between would be clear, blue sky, as seen from your point of view. The clouds that you saw are the so-called cumulus clouds, and belong to the lower atmosphere; they are not likely to have been more than a mile high at the top, but even if they were two miles, they would still be called lower clouds. This diagram, therefore, shows you that if the height of *A* and *B* above the ground was only two miles, and you were midway between them at *C*, then by walking a few miles east or west you would have gotten a very different view of the whole phenomenon, and persons who live five miles away would have seen nothing of it whatever. It is, therefore, not surprising that we have no records of the same phenomenon observed at other points of the country.

As the winds at *A* and *B* were fairly well balanced against each other, this clear intervening space remained nearly stationary; but eventually one must overcome the other, and, as you say that "it vanished gradually from the north", I infer that the blue sky was covered by clouds coming from that direction, where, as the map shows, we had high pressure and cold northerly winds. The whole country seems to have been covered by clouds next day.

LENTICULAR-CUMULUS CLOUDS IN COLORADO.

By J. B. WILLSEA. Dated Fruita, Mesa County, Colo., July 18, 1907.

The article on page 456 of the MONTHLY WEATHER REVIEW, for October, 1906, on lenticular-cumulus clouds has just come to my notice.

We have here an occasional cloud which may possibly be classed as lenticular-cumulus. It is of a rather dark color and in form resembles a saucer, or a number of saucers, placed one within the other, and then the pile turned upside down—the upper surface being convex, with a sharply defined outline—the lower surface not so pronouncedly convex and with a softer outline.

It usually accompanies or precedes a brisk wind and may appear singly or in numbers as high as five or six, altho two or three is ordinarily the limit.

Fig. 1 is a rough draft of them.

FIG. 1.—Lenticular-cumulus clouds.

They are always horizontal and sometimes move with considerable rapidity.

The pronounced cap shown in the third of Mr. Endicott's photographs (fig. 3, page 458, REVIEW for October, 1906), has not been observed by me.

I am convinced that those observed here are alto-cumulus clouds, seen edgewise, for the following reasons:

1. Because they have appeared in company with well-defined groups of alto-cumulus clouds, apparently at the same elevation, of the same shade, and apart from all other clouds.

2. Because these clouds are never seen near the zenith—always at a distance.

3. Because an alto-cumulus cloud, composed of one or more patches, reaching in a line toward the observer, must of necessity (when at a distance, so as to be seen edgewise), assume this form.

The clouds below the principal ones in Mr. Endicott's photographs show a suggestion of this formation, but the lower clouds are not in a direct line toward the observer, but bear away to the left. It was a puzzle to me for a long time why these clouds were not seen near the zenith.

Allow me to ask why the points at the sides of the clouds always curve slightly downward, never upward.

As to another matter, that of precipitation following a solar halo, I will say that in nearly five years my records show 16 halos, and that considering the following days 6 halos were followed by precipitation while 10 halos were not; but this is a very dry climate where we get only 8 or 10 inches of precipitation per annum.

DISTINGUISHED COOPERATIVE OBSERVERS.

The Weather Bureau has maintained many stations for thirty-seven years past, but, as is well known, its observers are employed specifically for such work, have a great variety of duties, and are often moved from one station to another, while the exact locations of the offices and instruments are also frequently changed, so that the comparability of methods and exposures is impaired.

Very different conditions pertain with our faithful voluntary cooperative observers. In these cases there are but few changes in the instruments or the locations or the men at any

station, and the comparability of the records during a long period of time is assured by the spirit of conservatism that must animate a man who voluntarily undertakes a meteorological record and carries it along continuously for many years. The following list includes, we believe, all the cases known to the Records Division in which the same person or family has maintained a record at the same place for thirty years or more *and is still reporting.* Also a few observers are included who are no longer maintaining observations. If any observers are accidentally omitted from this list we hope we shall hear from them, and we shall be glad to publish their names.

A still longer list could be made of observers who have closed their work and past away. We desire short biographical sketches of each person who has thus nobly devoted himself to the recording of the weather.

In the early history of the respective stations the record books do not always clearly show the names to whom the observations should be credited, and it is hoped that any errors discovered in the names will be reported in order that proper note may be made in the books.

Station.	Length of record.	Observer.
Canton, Conn	45 years	G. J. Case.
Riley, Ill	47 years	John West James.
Vevay, Ind	43 years	Miss Frederica Boerner.
Clinton, Iowa	37 years	Luke Roberts.
Fort Madison, Iowa	59 years	Doctor McCready. Miss Lucy A. McCready.
Logan, Iowa	38 years	Jacob Stern. Mrs. M. B. Stern. Glenn H. Stern.
Lawrence, Kans	39 years	Prof. F. H. Snow.
Cornish, Me	51 years	Silas West. T. H. West.
Fallston, Md	37 years	G. G. Curtis. J. H. Curtis.
Amherst, Mass	73 years	Prof. E. S. Snell. Miss S. C. Snell.
Fitchburg, Mass	43 years	Dr. Jabez Fisher.
Fall River, Mass	40 years	C. V. S. Remington.
Westboro, Mass	32 years	G. S. Newcomb.
Lansing, Mich	45 years	Prof. R. C. Kedzie. Dr. H. B. Baker.
Thornville, Mich	30 years	J. S. Caulkins, M. D.
Oregon, Mo	52 years	Wm. Kaucher. G. C. Kaucher. Thos. Curry.
Genoa, Nebr	31 years	Geo. S. Truman.
Concord, N. H	51 years[1]	J. H. Foster. W. L. Foster. W. W. Flint.
Moorestown, N. J	42 years	T. J. Beans. John C. Beans.
South Orange, N. J	37 years	Wm. J. Chandler.
Trenton, N. J	41 years	E. R. Cook.
Cooperstown, N. Y	52 years	G. Pomeroy Keese.
Palermo, N. Y	54 years	E. B. Bartlett.
Cleveland, Ohio	51 years[2]	Gustavus A. Hyde.
Jacksonburg, Ohio	40 years	Dr. J. B. Owsley.
North Lewisburg, Ohio	56 years	H. D. Gowey.
Portsmouth, Ohio	78 years	Dr. G. S. B. Hempstead. Dr. D. B. Cotton. Dr. H. A. Schirrmann.
Wauseon, Ohio	37 years	Thomas Mikesell.
The Dalles, Oreg	32 years	S. L. Brooks.
West Chester, Pa	52 years	J. C. Green, D. D. S.
Manitowoc, Wis	57 years	Jacob A. Lups. Miss Johanna Lups.

CORRIGENDA.

MONTHLY WEATHER REVIEW for April, 1907, Vol. XXXV, No. 4, page 173, Table 1, for 1903, line IX, column *Q*, for "1.011" read "1.041"; line X, column *f*, for "7.4" read "7.1"; year 1904, line Mean, column *f*, for "6.9" read "5.9". Page 175, column 2, third line from end of article, for "Table 3" read "Table 4".

[1] Established as a regular Weather Bureau station in 1902.
[2] Discontinued observations on December 31, 1905.

THE WEATHER OF THE MONTH.

By Mr. P. C. DAY, Assistant Chief, Division of Meteorological Records.

PRESSURE.

The distribution of mean atmospheric pressure for June, 1907, over the United States and Canada is graphically shown on Chart VI, and the average values and departures from the normal are shown for each station in Tables I and V.

The balance of pressure toward the north, noted in the MONTHLY WEATHER REVIEW for May as the chief factor contributing to the unseasonable weather that prevailed east of the Rocky Mountains during that and the preceding month, continued well into June over the Great Lakes, the upper Ohio Valley, New England, and the Middle Atlantic States.

Early in the month the summer type of low pressure became established over western Texas and adjacent districts, and normal weather conditions prevailed over the Gulf States and the territory between the Mississippi River and the Rocky Mountains from Kansas southward.

Over the region north of the Great Lakes, and over New England, pressure continued comparatively high till near the middle of the month, and the absence of the usual summer type of high pressure over the South Atlantic States during that period brought the greater portion of the districts east of the Mississippi Valley under the influence of northerly and easterly winds; and cloudy, cold weather, unprecedented for June, resulted. During the latter part of the month comparatively high pressure became fairly well established over the south Atlantic coast districts, the remnant of the great area of high pressure that appears to have prevailed over the region north of the Great Lakes during the preceding months drifted eastward into the North Atlantic, and southerly winds and seasonable weather were maintained over all districts east of the Rocky Mountains until the last few days of the month.

While the establishment of the normal pressure distribution east of the Rocky Mountains was accomplished about the middle of the month, west of the mountains, especially over the middle and southern Plateau districts, high pressure was dominant until after the 20th, and seasonable weather was delayed accordingly.

The mean pressure for the month was deficient in all districts of the United States and Canada, except over the southern portions of the Plateau and Pacific coast districts, and the extreme eastern portions of the Maritime Provinces of Canada.

Over the Canadian northwest territories, the eastern slope of the Rocky Mountains, the Ohio Valley, and the Middle Atlantic States the pressure averaged .05 inch or more below the normal.

Marked deviations from the normal occurred in the change in pressure from May to June. Over the Gulf States and the Ohio and lower Mississippi valleys, where the pressure normally increases from May to June, the reverse occurred and pressure averaged decidedly lower in June than in the preceding month. Over the middle and southern Plateau districts, where pressure normally decreases as summer approaches, the average for the month was decidedly higher than in May.

Marked variations also occurred over the districts between the Great Lakes and the Rockies from Nebraska and Iowa northward into Canada, where the changes from May to June ranged from —.10 to —.25 inch.

TEMPERATURE.

The abnormal displacement of the more or less permanent areas of high and low pressure, and the corresponding deflection of the surface winds from their normal courses, that had

contributed so largely to the remarkably cold weather of the two preceding months, continued till near the middle of June over all districts east of the Rocky Mountains, except the Plains region from Kansas south and along the west Gulf States.

Over western Texas and adjacent districts warm, seasonable weather was inaugurated early in the month, and normal temperatures were generally maintained thruout the month.

The breaking up of the high-pressure area over the Great Lakes and the St. Lawrence Valley about the middle of the month, and the advent of warm southerly winds marked the beginning of seasonable weather over the northeastern districts of the United States, and the temperatures thereafter were normal or slightly above until near the close of the month.

The accumulated deficiency in the daily mean temperature during the first part of the month was so great, however, that the monthly means over the Ohio Valley and middle Atlantic coast districts were far below the average. In parts of Maryland and Virginia and in the District of Columbia the mean temperature for the month was lower than previously recorded in June during the entire period of observation—nearly one hundred years.

West of the Rocky Mountains cold weather continued until the end of the second decade of the month, due to continued high pressure, and cold northerly winds. Over portions of Utah, Nevada, Wyoming, and Idaho the temperature averaged from 6° to more than 8° daily below the normal, and the monthly means were the lowest recorded in June for more than fifty years, the period covered by observations.

The mean temperature over nearly all districts averaged considerably below the normal, the only exceptions being small areas in south-central Texas, the immediate Gulf coast, the western portions of Washington and Oregon, and a few points in the Lake Superior region.

North of the International Boundary the temperatures were more nearly normal, and in the northern districts of Canada the month appears to have been warmer than the average.

Maximum temperatures of 90°, or above, were recorded in nearly all districts, except portions of the lower Lake region, in the Appalachian Mountains, along the Pacific coast, and in the Rocky Mountains and Plateau districts.

The dates of occurrence of the higher temperatures were scattered thru the latter half of the month, and no period of continued excessive heat occurred except during the last two days of the month over portions of northern and western Texas and eastern New Mexico.

The presence of an area of low barometric pressure over that section on the 29th and 30th gave ideal conditions for the generation of hot, dry, southerly winds. Temperatures from 100° to 117° were recorded in the shade, and the accompanying dry winds were exceedingly trying to both animal and vegetable life. Maximum temperatures from 100° to 120° were also recorded over portions of southwestern Arizona and the interior of southern California.

Minimum temperatures were decidedly low, and light to killing frosts were frequent in the more northern districts during the first half of the month. Decidedly cool weather prevailed from the 13th to 19th over the middle Plateau and surrounding districts, and frosts were reported from many points in Utah, Nevada, Colorado, Wyoming, and the northern portions of Arizona and New Mexico.

PRECIPITATION.

The distribution of precipitation during June, 1907, is graphically shown on Chart IV by appropriate shading or by figures representing the actual amount of fall.

In June the area of heaviest precipitation is usually transferred from its position in May west of the Mississippi River to the Gulf and south Atlantic coasts, where the average fall ranges from 5 to 8 inches.

Over California and the southern Plateau region precipitation is usually very light, while over the Great Plains, the Missouri and Mississippi valleys, and eastern districts the fall is usually sufficient for all requirements. During the current month marked deviations from the normal occurred in the Gulf districts and in California.

The rainfall over the entire Gulf region was unusually light. Practically no rain occurred along the immediate coasts of Texas and Louisiana, and over large portions of both States the total fall was less than one-half inch. This was in marked contrast with the fall over that section in the preceding month, in which the amounts measured varied from 5 to nearly 30 inches. A similar contrast is noted over the greater part of California, where the dry weather of May was followed in June by a period of frequent showers lasting to the 14th of the month. The period from the 11th to 14th, inclusive, brought unusually heavy rains for the season to nearly all points in the State, and the monthly falls were probably greater than previously recorded in June.

Precipitation was unusually heavy over the greater portion of Montana, and especially over the part of the State just east of the main divide, where the falls were of frequent occurrence and the totals for the month ranged from 6 to 8 inches.

Over the greater part of Utah and Nevada rainfall was of frequent occurrence during the first half of the month, and the monthly amounts were far in excess of the usual fall.

Precipitation was decidedly below the normal (—2 to —4 inches) over the entire Gulf region, the central Mississippi and lower Ohio valleys, the northern portions of Minnesota and Wisconsin, and the northwestern part of Washington. It was slightly below normal over the Lake region and in portions of the upper Missouri Valley and generally deficient in the Puget Sound district.

Precipitation was largely in excess of the average over the middle Atlantic coast districts, including the mountainous portions of Kentucky and Tennessee, and also over districts west of the Mississippi River between northern Texas and southern Minnesota, including the eastern portions of Nebraska and Kansas and the whole of Oklahoma. Slight excesses occurred over northern New England, southeastern Florida, and the greater part of the territory west of the Rocky Mountains, except Washington and Oregon.

Precipitation in all portions of the United States was generally well distributed during the several periods of the month, except over the territory west of the Rocky Mountains, where most of it occurred during the first fifteen days.

Thunderstorms were of frequent occurrence and severe local storms having the characteristics of tornadoes were reported from several localities, especially North Dakota, Kentucky, Illinois, Indiana, and Kansas. A number of lives were lost and much damage done to farm and other property from sudden and heavy downpours of rain in Kentucky.

Snowfall was unusually heavy in the mountains of California, where at some of the higher elevations of the Sierra Nevadas depths as great as 4 feet were recorded.

There was considerable snowfall in all the Rocky Mountain and higher elevations of the Plateau districts, and occasional flurries over the northern tier of States as far south as Ohio, Pennsylvania, and New Jersey.

The cool weather over the mountain districts retarded materially the melting of the snow on the high ranges where, especially over the northern districts and on the high levels of the Sierra Nevadas in California, large masses of snow still remained unmelted at the end of the month, and prospects were good for an abundant supply of water thruout the summer.

HUMIDITY AND SUNSHINE.

A uniform deficiency of moisture in the atmosphere prevailed over the south Atlantic and Gulf districts, most of New England, the upper Lake region, and along the north Pacific coast.

Over all districts from the middle Atlantic coast westward thru the Ohio and middle Mississippi valleys and Plains region and the entire Rocky Mountain, Plateau, and middle Pacific coast districts, there was a decided excess of moisture in the atmosphere. Over most of the Plateau region the excess ranged from 10 to 20 per cent.

Sunshine was uniformly deficient during the first half of the month over nearly all districts east of the Rocky Mountains, while over the districts to the west cloudy weather was maintained till near the 20th.

During the latter part of the month sunshine was generally abundant and the favorable conditions as to temperature and moisture rapidly developed vegetation, promoted the progress of farm work, and materially advanced toward normal conditions an unusually late season.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	12	60.9	− 3.0	−18.4	− 3.1
Middle Atlantic	16	65.5	− 4.7	−12.2	− 2.0
South Atlantic	10	74.1	− 2.0	+ 3.0	+ 0.5
Florida Peninsula*	8	79.2	− 0.6	+10.5	+ 1.8
East Gulf	11	76.8	− 1.3	+11.9	+ 2.0
West Gulf	10	78.8	− 0.1	+13.9	+ 2.3
Ohio Valley and Tennessee	13	69.7	− 3.5	− 3.0	− 0.5
Lower Lake	10	63.9	− 3.0	−13.8	− 2.3
Upper Lake	12	62.2	+ 0.1	−10.1	− 1.7
North Dakota*	9	62.4	− 1.2	−19.4	− 3.2
Upper Mississippi Valley	15	67.7	− 3.2	− 6.5	− 1.1
Missouri Valley	12	68.8	− 2.2	− 2.5	− 0.4
Northern Slope	9	58.9	− 3.2	− 6.2	− 1.0
Middle Slope	6	70.5	− 1.2	+ 6.9	+ 1.2
Southern Slope*	7	75.8	− 0.1	+13.8	+ 2.3
Southern Plateau*	12	68.2	− 5.3	+ 3.0	+ 0.5
Middle Plateau*	10	58.7	− 5.5	+ 9.4	+ 1.6
Northern Plateau*	12	58.3	− 3.0	− 2.0	− 0.3
North Pacific	7	57.1	− 0.5	− 0.9	− 0.2
Middle Pacific	8	62.1	− 2.1	− 0.3	0.0
South Pacific	4	63.1	− 1.0	+ 3.8	+ 0.6

* Regular Weather Bureau and selected cooperative stations.

In Canada.—Director R. F. Stupart says:

The mean temperature was a little higher than the average in the northern portions of Ontario, Manitoba, and Saskatchewan and on Vancouver Island, while in other parts of the Dominion it was below the average, the largest negative departure, about 4°, being in southwestern Ontario. The month opened rather cool in nearly all parts of the Dominion, but within a few days the weather became warm and seasonable. In the west no very pronounced hot spells have occurred, but in Ontario and Quebec, since the 16th, the temperature has frequently exceeded 80°, and on several days 90° has been reached in many localities.

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.6	+ 0.5	Missouri Valley	5.0	+ 0.2
Middle Atlantic	5.7	+ 0.7	Northern Slope	5.0	+ 0.2
South Atlantic	4.6	− 0.3	Middle Slope	4.4	+ 0.7
Florida Peninsula	4.3	− 1.8	Southern Slope	3.4	− 1.0
East Gulf	4.5	− 0.8	Southern Plateau	1.7	− 0.2
West Gulf	3.7	− 0.9	Middle Plateau	3.9	+ 0.9
Ohio Valley and Tennessee	5.3	+ 0.3	Northern Plateau	5.7	+ 0.6
Lower Lake	5.0	+ 0.1	North Pacific	6.1	0.0
Upper Lake	4.7	− 0.5	Middle Pacific	4.4	+ 1.2
North Dakota	5.5	+ 0.3	South Pacific	3.3	0.0
Upper Mississippi Valley	5.2	+ 0.2			

WEATHER IN ALASKA.

Reports from Alaska indicate the prevalence of seasonable weather. Stations as far north as the Arctic Circle show minimum temperatures well above freezing; and maximum temperatures as high as 80° occurred.

Rainfall appears to have been normal and no snow was noted as having occurred.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		Inches.	Inches.
New England	12	2.78	90	−0.3	−3.70
Middle Atlantic	16	4.65	124	+0.9	−2.50
South Atlantic	10	5.21	106	+0.3	−6.30
Florida Peninsula*	8	6.16	90	−0.7	−5.10
East Gulf	11	2.21	44	−2.8	−2.60
West Gulf	10	2.23	57	−1.7	−3.90
Ohio Valley and Tennessee	13	3.79	88	−0.5	−1.20
Lower Lake	10	3.42	94	−0.2	−1.10
Upper Lake	12	2.86	76	−0.9	−2.10
North Dakota*	9	3.04	86	−0.5	−2.30
Upper Mississippi Valley	15	4.03	89	−0.5	−1.50
Missouri Valley	12	4.62	107	+0.3	−1.50
Northern Slope	9	2.82	111	+0.3	+0.30
Middle Slope	6	3.12	103	+0.1	−1.40
Southern Slope*	7	3.64	124	+0.7	−0.90
Southern Plateau*	12	0.69	141	+0.2	+1.90
Middle Plateau*	10	0.92	177	+0.4	+1.80
Northern Plateau*	12	2.15	159	+0.8	+0.90
North Pacific	7	1.33	62	−0.8	−7.20
Middle Pacific	8	0.98	258	+0.6	+2.90
South Pacific	4	0.12	100	0.0	+1.70

* Regular Weather Bureau and selected cooperative stations.

In Canada.—Director Stupart says:

Over the Dominion as a whole the rainfall of June was less than average, the most pronounced deficiencies occurring in southern New Brunswick, New Ontario, and in British Columbia. In Alberta the fall was nearly average, as it also was in northern New Brunswick and southwestern Ontario. Nearly all stations in the Province of Quebec recorded an excess approximating 1 inch; and western Manitoba and southern Saskatchewan also recorded an excess, and in some few localities the rainfall may have been as much as double the average amount.

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	77	− 2	Missouri Valley	69	+ 2
Middle Atlantic	76	+ 3	Northern Slope	65	+ 8
South Atlantic	77	− 1	Middle Slope	62	+ 2
Florida Peninsula	77	− 3	Southern Slope	56	0
East Gulf	72	− 3	Southern Plateau	35	+ 5
West Gulf	72	− 4	Middle Plateau	48	+11
Ohio Valley and Tennessee	72	+ 2	Northern Plateau	56	+ 5
Lower Lake	72	+ 1	North Pacific	76	0
Upper Lake	71	− 2	Middle Pacific	67	+ 5
North Dakota	70	+ 2	South Pacific	66	0
Upper Mississippi Valley	74	+ 4			

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Amarillo, Tex	3	52	se.	Mount Tamalpais, Cal.	13	56	nw.
Block Island, R. I	2	52	ne.	Do	21	60	nw.
Duluth, Minn	16	52	w.	Do	28	50	nw.
Do	17	52	nw.	Nantucket, Mass	3	53	ne.
El Paso, Tex	19	50	sw.	Oklahoma, Okla	24	50	sw.
Evansville, Ind	7	52	sw.	Pierre, S. Dak	13	54	se.
Fort Smith, Ark	26	54	nw.	Do	14	50	sw.
Hatteras, N. C	5	50	w.	Pittsburg, Pa	5	52	w.
Do	29	50	sw.	Point Reyes Light, Cal.	7	58	nw.
Jacksonville, Fla	29	62	sw.	Do	8	67	nw.
Key West, Fla	1	50	w.	Do	9	52	nw.
Lincoln, Nebr	24	51	w.	Do	13	50	nw.
Marquette, Mich	16	54	sw.	Do	14	53	nw.
Memphis, Tenn	24	52	nw.	Do	21	84	nw.
Do	26	54	nw.	Do	23	52	nw.
Modena, Utah	11	50	sw.	St. Louis, Mo	1	50	ne.
Do	12	52	sw.	Sand Key, Fla	1	57	nw.
Do	22	50	sw.	Toledo, Ohio	5	51	w.
Mount Tamalpais, Cal	7	54	nw.	Valentine, Nebr	13	54	e.

CLIMATOLOGICAL SUMMARY.

By Mr. JAMES BERRY, Chief of the Climatological Division.

TEMPERATURE AND PRECIPITATION BY SECTIONS, JUNE, 1907.

In the following table are given, for the various sections of the Climatological Service of the Weather Bureau, the average temperature and rainfall, the stations reporting the highest and lowest temperatures with dates of occurrence, the stations reporting greatest and least monthly precipitation, and other data, as indicated by the several headings.

The mean temperatures for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperature and precipitation are based only on records from stations that have ten or more years of observation. Of course the number of such records is smaller than the total number of stations.

Section.	Temperature—in degrees Fahrenheit.							Precipitation—in inches and hundredths.					
	Section average.	Departure from the normal.	Monthly extremes.					Section average.	Departure from the normal.	Greatest monthly.		Least monthly.	
			Station.	Highest.	Date.	Station.	Lowest.	Date.			Station.	Amount.	Station.	Amount.
Alabama	75.6	— 2.4	Wetumpka	100	22	Riverton	41	1	2.85	— 1.24	Lucy	8.31	Daphne	T.
Arizona	74.0	— 5.0	Aztec	124	29	Flagstaff	24	16	0.13	— 0.12	Pinto	0.98	17 stations	0.00
Arkansas	75.2	— 1.2	La Crosse	103	24	Pond	39	2	4.48	+ 0.34	Dutton	10.38	Clarendon	1.40
California	66.1	— 2.9	Mammoth Tank	121	28	Tamarack	2	13	1.02	+ 0.60	Tamarack	6.39	25 stations	0.00
Colorado	58.2	— 3.3	Hoehne	101	29	Corona	20	1	1.13	— 0.43	Holyoke	4.80	Salida	0.15
Florida	78.8	— 1.2	Archer	101	13	Johnstown	53	15	5.76	— 1.31	Hypoluxo	10.80	Pensacola	0.94
Georgia	76.0	— 2.0	Fleming	102	10	Clayton	43	6	4.29	— 0.33	Fleming	12.60	Americus	1.24
Hawaii	74.1†	.....	Kihei, Maui	93	30	Volcano House, Haw.	49	13	5.21‡	.....	KeanaeValley, Maui	18.45	2 stations	0.00
Idaho	56.9	— 3.4	Moscow	98	20	Forney	24	14	2.34	+ 1.17	Forney	4.94	Nevins Ranch	0.85
Illinois	68.4	— 3.1	5 stations	95	17,30	Lanark	37	6	4.47	+ 0.38	Benton	10.72	Joliet	1.70
Indiana	67.9	— 3.8	3 stations	95	3 dates	Northfield Salamonia	37 37	3 3	4.65	— 0.71	Richmond	7.51	Eminence	2.00
Iowa	66.5	— 2.9	Clarinda	98	16	Atlantic	36	2	5.35	+ 0.79	Northwood	9.33	Davenport	2.07
Kansas	72.0	— 1.1	Jetmore	104	14	Republic	36	5	5.02	+ 0.40	Howard	12.59	Wallace	0.81
Kentucky	70.2	— 3.7	Bowling Green	95	3 dates	Eubank	41	6	4.87	+ 0.76	Mount Sterling	9.41	Louisville	1.21
Louisiana	79.2	— 0.6	Alexandria	102	26	Plain Dealing Robeline	50 50	3 3	1.77	— 3.73	So. University Farm	5.08	Cameron	0.03
Maryland and Delaware	64.9	— 5.8	Cambridge, Md	96	25	Deer Park, Md Oakland, Md	32 32	7 7	5.71	+ 1.71	Cumberland, Md	8.40	Salisbury, Md	3.49
Michigan	62.7	— 1.1	Harrisville	100	17	Wetmore Mount Pleasant	25 25	4 4	2.49	— 0.56	Wasepi	5.99	Wetmore	0.30
Minnesota	63.3	— 1.4	Stephens Mine Wabasha	95 95	16 17	Hallock	28	5	4.31	+ 0.26	Fairmount	9.16	Hoveland	0.75
Mississippi	76.5	— 2.4	Natchez	99	26	Ripley	45	3	2.41	— 2.62	Merrill	10.20	Bay Saint Louis	0.28
Missouri	71.2	— 2.4	Caruthersville	97	24	Neosho Willowsprings	40 40	2 1	5.84	+ 0.80	Warrensburg	10.35	Caruthersville	0.94
Montana	56.9	— 2.1	Decker Miles City	90 90	30 19	Wolf Creek	23	5	4.10	+ 1.75	Choteau	8.10	Billings	1.17
Nebraska	67.0	— 1.6	Franklin	103	29	Hay Springs	30	2	4.03	+ 0.09	Holdrege	7.68	Greeley	1.63
Nevada	56.9	— 6.3	Logan	111	28	Hamilton Palmetto	18 18	14 15	1.09	+ 0.67	Eureka	3.86	4 stations	0.00
New England*	62.2	— 2.5	Millinocket, Me	101	18	Patten, Me	30	12	3.60	+ 0.06	Patten, Me	10.04	Bristol, R. I	1.31
New Jersey	64.7	— 4.8	Elizabeth	96	26	Charlotteburg	31	13	4.41	+ 0.76	Moorestown	6.85	Jersey City	3.15
New Mexico	65.9	— 3.6	Carlsbad	110	29	Elizabethtown	28	1	1.19	0.00	San Jon	4.54	2 stations	T.
New York	62.9	— 2.4	Indian Lake	98	19	Paul Smiths	27	12	3.28	— 0.24	Wappinger Falls	5.85	Rochester	1.41
North Carolina	70.5	— 4.0	Setzle	99	26	Sapphire	37	7	7.02	+ 2.51	Washington	11.85	Asheville	8.06
North Dakota	61.9	— 0.9	Melville	95	28	Palermo	25	5	2.85	— 0.65	Cando	5.58	Donnybrook	1.34
Ohio	65.6	— 4.0	Amesville	96	22	Green Hill	36	7	4.57	+ 0.81	Greenville	9.48	Bladensburg	2.06
Oklahoma and Indian Territories.	75.1	— 1.4	Chattanooga, Okla	103	30	Brule, Okla	35	2	5.34	+ 2.28	Grand, Okla	9.82	Keuton, Okla	1.27
Oregon	58.9	— 0.3	4 stations	99	3 dates	Huntington Lakeview	22 22	1 14	1.95	+ 0.17	Gold Beach	5.77	Hermiston	0.27
Pennsylvania	63.6	— 4.7	Wilkes-Barre	98	22	Pocono Lake	30	4,10	4.99	+ 0.95	Hyndman	8.55	Montrose	2.79
Porto Rico	77.5	.....	Manati	96	15,16	Aibonito	49	14	5.13	.....	Río Blanco	12.32	Adjuntas	0.00
South Carolina	75.4	— 2.5	Blackville Florence	99 99	25 10	Walhalla	47	28	5.92	+ 1.16	Darlington	12.38	Clemson College	2.22
South Dakota	64.2	— 1.7	Cherry Creek Marion	97 97	18 23	Ashcroft	27	4	3.90	+ 0.21	Ramsey	8.79	Stephan	0.44
Tennessee	71.9	— 2.6	Arlington	96	23	Erasmus Rugby	37 37	6 6	4.06	— 0.41	Tellico Plains	9.62	Wildersville	1.08
Texas	79.8	— 0.4	Big Springs	117	30	Channing	41	2	1.71	— 1.75	Canadian	5.90	8 stations	0.00
Utah	58.8	— 6.0	St. George	105	30	Lucin Soldiers Summit	16 16	16 19	1.22	+ 0.85	Ogden No. 1	3.27	2 stations	0.05
Virginia	66.0	— 6.0	Arvonia Cape Henry	93 93	25 25, 26	Burkes Garden	34	4	6.34	+ 2.10	Marion	11.44	Hampton	2.93
Washington	60.3	— 1.0	Mottingers Ranch	102	27	Wilbur	30	13	1.47	— 0.39	Ashford	4.63	Trinidad	0.18
West Virginia	65.3	— 4.8	Romney	97	25	Bayard	33	7	6.00	+ 1.19	Princeton	11.95	Powellton	1.93
Wisconsin	63.7	— 1.7	Antigo Ashland	98 98	17 16	Koepenick	28	6	3.57	— 0.59	Grantsburg	7.11	Herbster	0.93
Wyoming	53.7	— 3.0	Fort Laramie	94	15	South Pass City	17	17	1.95	+ 0.32	F't'n Hotel, Y. N. P.	4.74	Leo	T.

* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. † 46 stations, with an average elevation of 743 feet. ‡ 138 stations.

DESCRIPTION OF TABLES AND CHARTS.

By Mr. P. C. DAY, Assistant Chief, Division of Meteorological Records.

For description of tables and charts see page 30 of REVIEW for January, 1907.

TABLE I.—*Climatological data for U. S. Weather Bureau stations, June, 1907.*

Stations.	Elevation of instruments.			Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.								Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.			Wind.					Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness during daylight, tenths.	Total snowfall.
	Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Actual, reduced to mean of 24 hours.	Sea level, reduced to mean of 24 hrs.	Departure from normal.	Mean max. + mean min. ÷ 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.				Total.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.					
New England.							60.9	— 3.0									77	2.78	— 0.3										5.6	
Eastport	76	69	85	29.85	29.93	— .00	52.6	— 1.8	80	28	61	39	2	44	31	48	45	80	1.57	— 2.0	9	6,348	s.	40	e.	6	6	12	12	6.8	
Portland, Me.	103	81	117	29.81	29.93	— .02	59.6	— 3.0	95	18	68	41	1	51	34	54	50	75	3.55	+ 0.2	12	5,399	s.	36	ne.	30	9	6	15	6.1	
Concord	288	70	79	29.61	29.92	— .04	63.2	— 1.2	94	18	75	38	4	51	39	....	....	....	3.07	— 0.1	8	3,312	se.	30	sw.	26	19	6	5	3.6	
Burlington	404	12	47	29.50	29.92	— .04	63.5	— 3.3	92	18	74	37	11	54	34	....	....	....	4.21	+ 0.6	13	6,303	s.	36	e.	5	8	13	9	5.8	
Northfield	876	16	70	29.00	29.94	— .02	60.5	— 2.2	92	18	73	33	1	48	41	57	54	81	3.70	+ 0.6	14	4,391	s.	32	sw.	26	9	8	13	6.1	
Boston	125	115	188	29.80	29.93	— .03	65.1	— 0.7	94	18	74	45	2	56	28	59	55	72	2.56	— 0.5	10	6,916	sw.	34	w.	27	7	12	11	6.1	
Nantucket	12	14	90	29.93	29.94	— .04	57.8	— 3.5	81	22	64	43	2	51	25	54	52	85	2.17	— 0.6	11	10,541	sw.	53	ne.	3	13	6	11	5.4	
Block Island	26	11	46	29.91	29.94	— .03	58.8	— 2.8	78	22	65	44	1	53	20	55	53	86	1.81	— 0.8	11	10,453	sw.	52	ne.	2	11	12	7	5.1	
Narragansett	....	9	....	....	....	.....	58.4	— 5.8	84	16	67	39	*	50	34	....	....	....	1.99	— 0.6	9	.....	sw.	....	.....	....	19	2	9	....	T.
Providence	160	57	67	29.77	29.94	— .03	63.2	— 5.1	90	25	73	43	1	54	34	57	53	75	2.22	.....	11	4,408	se.	28	se.	30	11	10	9	5.4	
Hartford	159	122	132	29.76	29.93	— .04	64.8	— 2.3	90	22	75	40	1	54	33	58	54	72	3.44	.....	10	4,931	s.	24	w.	27	8	9	13	6.2	
New Haven	106	116	185	29.83	29.94	— .03	63.6	— 3.3	86	22	73	44	1	54	32	57	53	70	3.18	+ 0.2	9	5,732	s.	31	n.	3	10	13	7	5.2	
Mid. Atlantic States.							65.5	— 4.7									76	4.65	+ 0.9										5.7	
Albany	97	102	115	29.84	29.94	— .03	66.0	— 1.9	92	22	76	43	1	56	34	59	55	72	3.29	— 0.4	9	4,800	s.	30	n.	9	4	17	9	6.2	
Binghamton	875	78	90	29.02	29.95	— .02	62.6	— 3.6	91	22	74	41	10	52	37	....	....	....	2.42	— 0.9	11	3,946	ne.	34	s.	5	8	6	16	6.6	
New York	314	108	350	29.60	29.94	— .04	66.2	— 2.3	88	25	74	45	2	59	28	58	54	69	3.29	+ 0.2	11	6,922	s.	48	ne.	2	10	13	7	5.1	
Harrisburg	374	94	104	29.56	29.96	— .03	65.6	— 4.7	88	25	74	45	2	57	27	58	53	68	3.43	— 0.8	12	4,954	w.	33	w.	5	7	12	11	6.0	
Philadelphia	117	116	184	29.83	29.95	— .03	66.8	— 4.4	89	22	75	46	2	59	29	59	54	68	4.66	+ 1.5	11	6,635	sw.	32	ne.	2	7	7	16	6.7	
Scranton	805	111	119	29.10	29.95	— .03	64.2	— 3.0	92	22	75	43	2	54	32	57	52	67	3.30	.....	10	4,852	sw.	38	w.	5	8	8	14	6.2	
Atlantic City	52	37	48	29.90	29.96	— .02	62.4	— 4.4	82	17	68	47	2	57	23	58	56	80	3.80	+ 0.6	12	5,669	s.	33	e.	2	5	11	14	6.2	
Cape May	17	48	52	29.95	29.97	— .01	62.5	— 5.2	81	25	68	48	2	57	24	58	....	....	5.43	+ 2.3	13	5,801	e.	36	ne.	2	8	13	9	5.5	T.
Baltimore	123	69	117	29.81	29.94	— .05	66.7	— 6.3	90	25	75	47	2	58	29	60	55	69	5.22	+ 1.2	11	5,490	nw.	35	w.	5	8	12	10	6.0	
Washington	112	59	76	29.83	29.95	— .05	65.9	— 6.8	89	22	75	48	2	57	31	62	59	82	4.86	+ 0.9	13	4,500	nw.	25	sw.	5	15	7	8	4.8	
Cape Henry	18	11	58	29.92	29.94	— .06	68.2	— 4.7	93	25	75	52	3	62	26	....	....	....	3.48	— 0.5	13	9,444	sw.	46	e.	1	15	7	8	4.5	
Lynchburg	681	83	88	29.22	29.96	— .05	67.6	— 5.9	89	22	77	48	4	58	30	63	61	84	7.00	+ 3.5	16	2,469	ne.	20	ne.	22	7	13	10	5.9	
Mount Weather	1,725	10	57	28.16	29.95	— .05	61.4	— 6.2	83	25	68	41	2	55	22	58	56	86	5.56	.....	14	10,053	nw.	49	nw.	5	9	10	11	5.4	
Norfolk	91	102	111	29.85	29.95	— .05	69.3	— 5.1	90	25	77	51	3	62	25	63	61	80	3.66	— 0.7	15	6,348	s.	34	se.	1	12	6	12	5.6	
Richmond	144	145	153	29.80	29.95	— .06	68.4	— 6.7	92	25	77	49	3	60	29	....	....	....	6.21	+ 2.6	12	5,481	n.	31	sw.	25	11	10	9	5.1	
Wytheville	2,293	40	47	27.62	29.94	— .07	64.8	— 3.9	85	22	74	43	4	55	31	59	58	84	8.47	+ 4.3	19	8,217	e.	23	w.	8	7	17	6	5.1	
S. Atlantic States.							74.1	— 2.0									77	5.21	+ 0.3										4.6	
Asheville	2,255	53	75	27.66	29.95	— .06	67.0	— 1.7	85	22	77	48	6	57	30	62	60	83	3.06	— 0.6	16	3,968	nw.	25	nw.	5	3	19	8	6.0	
Charlotte	773	68	76	29.13	29.96	— .05	72.6	— 2.9	92	21	82	55	6	63	29	64	61	74	4.19	— 0.4	13	4,165	ne.	31	w.	5	10	9	11	5.8	
Hatteras	11	12	47	29.94	29.95	— .06	71.5	— 2.9	84	25	77	56	3	66	20	68	67	88	6.31	+ 1.7	11	10,050	sw.	50	sw.	29	19	7	4	3.6	
Raleigh	376	71	79	29.56	29.95	— .06	71.2	— 3.9	91	21	80	52	3	62	28	64	61	76	6.73	+ 2.8	13	4,230	sw.	24	se.	1	9	12	9	5.1	
Wilmington	78	81	91	29.88	29.96	— .05	73.2	— 2.3	88	30	82	56	3	65	25	68	65	80	9.83	+ 4.1	13	5,589	sw.	38	n.	11	10	18	2	4.6	
Charleston	48	14	92	29.91	29.96	— .05	76.8	— 1.6	90	8	84	61	3	70	21	70	68	77	4.58	— 1.1	13	7,367	sw.	30	w.	2	13	15	2	4.4	
Columbia, S. C.	351	41	57	29.57	29.94	— .07	75.9	— 2.4	94	26	86	56	3	66	31	66	62	69	2.63	— 1.5	9	4,457	sw.	40	sw.	1	7	15	8	5.7	
Augusta	180	89	97	29.75	29.94	— .07	76.8	— 1.3	96	9	87	56	7	66	34	67	63	69	3.58	— 1.0	9	4,126	s.	32	sw.	5	18	11	1	3.9	
Savannah	65	81	89	29.89	29.96	— .05	77.5	— 0.7	96	9	86	62	3	68	25	69	66	75	8.44	+ 1.8	9	5,462	sw.	34	n.	13	14	13	3	4.2	
Jacksonville	43	101	129	29.93	29.98	— .03	78.3	— 0.7	94	9	86	62	3	70	22	73	71	83	2.71	— 2.7	8	6,720	sw.	62	sw.	29	17	10	3	3.6	
Florida Peninsula.							80.0	— 0.2									77	7.40	+ 0.8										4.3	
Jupiter	28	10	48	29.96	29.99	— .02	79.2	— 0.4	94	11	86	66	4	72	23	74	72	81	9.00	+ 2.5	16	7,200	se.	37	se.	25	10	15	5	5.3	
Key West	22	10	53	29.95	29.97	— .02	81.4	— 0.8	89	29	87	70	16	76	18	75	72	74	5.96	+ 2.0	12	6,115	se.	50	w.	1	13	10	7	4.6	
Sand Key	25	41	71	29.94	29.97	— .02	80.8	.....	93	11	85	69	1	77	15	....	....	....	1.96	.....	12	8,497	e.	57	nw.	1	15	7	8	4.1	
Tampa	35	79	96	29.96	29.99	— .02	79.4	+ 0.7	93	21	88	65	2	71	23	72	69	75	7.25	— 2.0	10	5,966	w.	44	sw.	29	18	9	3	3.2	
East Gulf States.							76.6	— 1.3									72	2.21	— 2.8										4.6	
Atlanta	1,174	190	216	28.75	29.96	— .05	74.2	— 1.4	90	9	84	54	2	65	29	65	61	69	1.95	— 2.0	9	6,763	w.	42	nw.	24	13	11	6	4.4	
Macon	370	55	66	29.57	29.96	— .05	77.6	+ 0.5	96	9	89	57	4	66	36	....	....	....	2.05	— 1.7	6	3,241	sw.	25	nw.	13	17	9	4	3.6	
Thomasville	273	8	57	29.68	29.97	— .03	78.0	— 1.5	95	24	90	58	16	66	32	69	66	72	4.55	— 0.7	10	3,626	sw.	24	sw.	28	17	12	1	3.4	
Pensacola	56	79	96	29.91	29.97	— .02	77.8	— 2.2	88	23	84	61	3	72	19	....	....	....	0.94	— 4.4	5	6,901	sw.	36	se.	28	11	16	3	4.3	
Anniston	741	9	58	29.20	29.98	— .02	73.4	— 1.6	93	21	85	49	6	62	32	....	....	....	2.04	— 2.1	10	1,831	s.	26	w.	23	8	14	8	5.7	
Birmingham	700	136	144	29.21	29.96	— .04	75.2	— 3.0	90	9	84	54	2	66	26	67	63	69	1.67	— 3.1	9	4,495	sw.	25	sw.	4	4	22	4	5.7	
Mobile	57	98	106	29.90	29.96	— .03	78.5	— 0.6	92	29	86	61	2	71	23	71	69	75	1.13	— 4.8	9	5,179	s.	29	nw.	11	5	22	3	5.5	
Montgomery	223	100	112	29.73	29.97	— .03	77.0	— 2.1	94	26	87	58	2	67	26	68	64	70	3.62	— 1.0	9	4,167	w.	36	ne.	23	9	17	4	4.9	
Meridian	375	84	93	29.57	29.95	— .03	76.0	— 1.3	92	24	86	54	2	66	29	69	66	74	1.84	— 4.4	10	3,314	sw.	24	n.	14	11	14	5	4.2	
Vicksburg	247	62	74	29.68	29.95	— .02	76.9	— 1.6	91	23	86	58	1	68	23	70	66	74	3.57	— 0.7	6	4,327	sw.	37	nw.	26	10	17	3	4.6	
New Orleans	51	88	121	29.91	29.96	— .02	80.2	+ 0.6	93	30	88	62	2	72	20	72	69	74	0.98	— 5.6	7	5,422	s.	30	n.	14	16	14	0	3.5	
West Gulf States.							78.8	— 0.1									72	2.23	— 1.7										3.7	
Shreveport	249	77	84	29.66	29.93	— .03	79.2	— 0.4	96	26	89	55	2	70	26	70	66	71	0.92	— 2.9	5	4,955	s.	46	n.	26	19	9	2	3.3	
Bentonville	1,303	11	44	28.56	29.92	— .02	71.6	— 2.5	89	7	83	46	2	61	33	....	....	....	7.70	+ 3.1	11	4,290	s.	25	s.	9	11	12	7	5.0	
Fort Smith	457	79	94	29.42	29.89	— .05	76.0	— 0.8	93	14	86	53	3	66	32	69	65	71	5.51	+ 1.2	8	5,437	e.	54	nw.	26	16	13	1	2.9	
Little Rock	357	93	100	29.55	29.92	— .04	76.3	— 0.9	91	10	85	55	3	67	28	68	65	70	2.13	— 2.2	8	5,027	s.	34	nw.	26	9	13	8	5.5	
Corpus Christi	20	48	53	29.89	29.91	.00	81.4	+ 0.8	92	30	86	65	1	77	20	75	73	81	T.	— 2.7	0	10,143	se.	30	se.	30	18	12	0	2.4	
Fort Worth	670	106	114	29.18	29.88	+ .04	79.6	— 0.5	97	30	89	56	2	70	32	....	....	....	2.22	— 1.1	4	8,195	s.	43	n.	4	14	16	0	3.4	
Galveston	54	106	112	29.90	29.96	+ .01	81.2	+ 0.3	90	28	85	64	1	77	16	74	71	77	T.	— 4.9	0	8,959	se.	28	nw.	1	14	16	0	3.4	
Palestine	510	73	79	29.38	29.90	— .04	78.4	0.0	92	30	87	56	1	70	25	71	68	75	1.39	— 2.9	5	5,962	s.	24	nw.	1	7	17	6	5.4	
San Antonio	701	80	91	29.16	29.87	— .03	82.8	+ 2.4	105	30	94	57	2	72	31	72	67	68	0.18	— 2.5	3	5,522	se.	22	se.	30	17	13	0	3.4	
Taylor	583	55	63	29.29	29.90	— .02	81.0	+ 1.0	102	28	91	57	1	71	28	....	....	....	0.56	.....	1	7,893	s.	29	s.	9	22	8	0	2.6	
Ohio Val. and Tenn.							69.7	— 3.5									72	3.79	— 0.5										5.3	
Chattanooga	762	106	112	29.17	29.97	— .03	73.0	— 2.4	91	9	83	52	6	63	30	65	61	71	4.43	— 0.1	12	4,382	w.	40	nw.	24	7	20	3	5.2	
Knoxville	1,004	93	100	28.91	29.95	— .05	71.0	— 2.4	88	22	81	49	6	61	27	64	60	74	4.28	+ 0.2	10	4,129	sw.	35	nw.	9	4	17	9	5.8	
Memphis	399	76	97	29.54	29.95	— .02	75.6	— 2.1	89	9	84	54	2	67	24	68	65	72	1.91	— 2.8	10	6,303	sw.	54	nw.	26	13	12	5	4.3	
Nashville	546	79	91	29.38	29.96	— .03	73.0	— 3.3	91	22	84	52	6	63	29	64	60	66	2.67	— 1.6	8	3,885	sw.	27	se.	21	7	13	10	6.1	
Lexington	989	75	102	28.89	29.93	— .07	68.6	— 4.6	88	18	77	51	3	60	25	....	....	....	3.65	— 0.6	13	5,907	sw.	48	n.	7	20	4	6	3.4	
Louisville	525	111	132	29.37	29.94	— .04	72.2	— 2.8	93	22	82	53	3	63	27	64	59	68	1.21	— 3.1	10	4,759	se.	39	sw.	23	5	15	10	5.8	
Evansville	431	72	82	29.44	29.90	— .07	72.0	— 3.3	89	20	81	51	3	63	25	....	....	....	2.59	.....	9	4,558	s.	52	sw.	7	9	20	1	4.8	
Indianapolis	822	154	164	29.05	29.92	— .05	68.0	— 4.4	88	22	77	45	3	59	25	60	56	68	4.68	0.0	10	6,121	s.	39	sw.	4	9	9	12	5.5	
Cincinnati	628	152	160	29.26	29.93	— .06	69.7	— 4.0	91	22	78	53	3	61	26	62	58	69	3.87	— 0.5	10	4,280	se.	32	w.	4	8	13	9	5.5	
Columbus	824	173	190	29.07	29.94	— .05	67.2	— 3.8	89	22	76	45	3	58	29	60	56	72	3.39	— 0.1	16	7,570	se.	48	w.	4	10	11	9	5.2	
Pittsburg	842	336	352	29.05	29.94	— .05	65.8	— 5.3	89	23	75	45	5	57	33	59	55	73	3.17	— 0.3	12	6,062	ne.	52	w.	5	6	14	10	6.1	
Parkersburg	638	77	84	29.29	29.94	— .06	68.0	— 3.5	90	22	78	49	3	58	31	61	58	77	4.98	+ 0.1	14	3,531	se.	31	nw.	5	12	12	6	4.7	
Elkins	1,940	41	80	27.95	29.96	— .04	62.4	— 4.2	86	21	73	41	7	51	39	56	54	80	7.26	+ 2.5	19	2,357	n.	27	w.	5	8	11	11	6.2	
Lower Lake Region.							63.9	— 5.0									72	3.42	— 0.2										5.0	
Buffalo	767	178	206	29.11	29.93	— .04	62.0	— 3.1	86	22	68	46	3	56	23	56	52	73	1.91	— 1.6	11	9,098	sw.	47	sw.	5	8	13	9	5.5	
Canton	448	10	71	29.44	29.91	.....	63.5	— 2.3	89	22	74	40	1	53	31	....	....	....	3.66	+ 0.2	13	7,058	sw.	36	sw.	5	14	8	8	4.5	
Oswego	335	76	91	29.57	29.93	— .04	61.6	— 2.2	88	23	70	43	7	54	24	56	52	73	2.88	— 0.5	8	5,807	w.	26	s.	5	12	7	11	4.8	
Rochester	523	81	102	29.38	29.95	— .02	64.8	— 1.3	92	23	74	44	3	55	30	57	53	68	1.11	— 2.1	9	5,676	sw.	28	sw.	5	11	9	10	5.4	
Syracuse	597	97	113	29.31	29.95	— .02	64.0	— 2.9	90	18	73	44	10	55	26	....	....	....	2.57	— 0.3	11	7,068	s.	38	s.	5	10	9	11	5.7	
Erie	713	92	102	29.18	29.94	— .04	62.8	— 4.2	85	23	70	43	3	56	21	57	53	73	3.69	— 0.2	11	6,547	w.	29	se.	11	9	12	9	5.4	
Cleveland	762	190	201	29.12	29.94	— .04	63.7	— 4.2	88	23	71	46	3	56	23	58	53	71	4.63	+ 0.8	18	8,426	se.	48	w.	25	10	12	8	5.2	T.
Sandusky	629	62	70	29.25	29.93	— .05	63.4	— 3.4	90	22	73	47	5	58	26	....	....	....	4.64	+ 0.7	15	4,921	e.	27	w.	5	13	9	8	4.2	
Toledo	628	207	246	29.26	29.93	— .04	66.2	— 3.2	89	22	74	46	3	58	26	60	56	78	4.55	+ 1.1	16	8,935	sw.	51	w.	5	14	9	7	4.3	
Detroit	730	218	258	29.16	29.94	— .03	64.8	— 3.0	87	18	73	44	6	56	30	59	55	73	3.60	— 0.1	14	7,749	s.	48	s.	23	7	11	12	5.4	
Upper Lake Region.							62.2	+ 0.1									71	2.86	— 0.9										4.7	
Alpena	809	13	92	29.28	29.94	— .02	61.2	+ 0.9	98	17	72	40	1	51	37	55	51	73	3.24	— 0.5	10	6,575	se.	34	nw.	5	12	14	4	4.3	
Escanaba	612	40	82	29.27	29.93	— .01	61.3	+ 0.7	85	16	70	44	7	52	32	55	50	70	1.85	— 2.0	12	6,348	s.	27	sw.	16	19	9	2	3.2	
Grand Haven	632	54	92	29.24	29.91	— .05	63.2	— 1.5	85	22	72	44	5	54	27	57	54	74	3.09	— 0.8	12	6,774	w.	30	se.	10	11	11	8	5.2	

TABLE I.—*Climatological data for U. S. Weather Bureau stations, June, 1907*—Continued.

Stations.	Elevation of instruments.			Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.								Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.			Wind.					Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness during daylight, tenths.	Total snowfall.
	Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Actual, reduced to mean of 24 hours.	Sea level, reduced to mean of 24 hrs.	Departure from normal.	Mean max. + mean min. ÷ 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.				Total.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.				
Up. Lake Reg—Cont.																													
Grand Rapids	707	121	162	29.17	29.93	— .04	66.2	— 1.9	88	17	76	46	5	56	30	59	55	70	1.82	— 1.4	10	6,602	w.	38	w.	23	10	11	9	5.6	
Houghton	668	66	74	29.20	29.92	— .02	61.2	+ 1.8	95	16	73	37	1	50	42	...	...	...	2.03	.....	7	5,054	e.	24	nw.	5	14	12	4	3.8	
Marquette	734	77	116	29.14	29.94	.00	59.4	+ 0.9	91	16	69	39	1	50	40	53	47	65	4.23	+ 0.7	6	5,544	nw.	54	sw.	16	11	13	7	4.6	
Port Huron	638	70	120	29.24	29.93	— .04	62.5	— 1.3	88	18	71	43	7	54	30	57	53	73	2.69	— 0.8	12	7,085	sw.	39	nw.	5	14	9	7	4.5	
Sault Ste. Marie	614	40	61	29.26	29.95	— .01	59.4	+ 1.8	85	16	72	37	6	47	38	54	48	67	1.61	— 1.5	6	5,564	se.	38	nw.	5	15	6	9	4.4	
Chicago	823	140	310	29.05	29.92	— .04	66.2	— 0.1	91	17	73	47	1	59	23	59	56	74	3.64	— 0.2	11	9,800	sw.	42	w.	22	12	11	7	4.9	
Milwaukee	681	122	138	29.21	29.94	— .01	63.2	— 0.3	90	17	72	46	1	55	26	56	52	70	4.48	+ 0.4	12	6,424	sw.	38	sw.	11	13	10	7	4.5	
Green Bay	617	49	86	29.24	29.90	— .05	65.2	+ 0.1	92	17	75	42	6	55	35	59	55	71	3.22	— 0.4	11	6,313	s.	32	se.	10	7	11	12	6.3	
Duluth	1,133	11	47	28.69	29.90	— .02	57.9	+ 0.2	88	16	68	38	12	88	31	51	46	69	1.59	— 3.0	8	8,131	ne.	52	w.	16	11	12	7	4.6	
North Dakota.							62.1	— 1.6									70	3.32	— 0.2										5.6	
Moorhead	940	8	57	28.87	29.88	— .02	62.9	— 1.4	88	16	74	38	5	52	33	58	53	77	4.29	— 0.1	9	5,715	se.	39	e.	15	5	19	6	5.4	
Bismarck	1,674	8	57	28.11	29.86	— .01	62.8	— 1.4	90	28	75	34	5	51	39	56	50	66	3.63	+ 0.1	15	8,352	nw.	45	se.	13	14	9	7	4.8	
Devils Lake	1,482	11	44	28.28	29.83	— .05	61.4	— 1.2	90	21	73	38	5	50	44	54	49	70	4.88	+ 0.8	15	8,872	se.	40	se.	20	10	6	14	5.7	
Williston	1,875	14	44	27.86	29.81	— .05	61.2	— 2.3	84	27	73	33	5	50	39	54	49	68	2.03	— 1.4	13	6,827	se.	40	sw.	16	7	11	12	6.2	
Upper Miss. Valley.							67.7	— 3.3									74	4.03	— 0.5										5.2	
Minneapolis		102	208				65.6		91	16	75	44	1	56	29				4.03	+ 0.2	11	8,099	w.	44	se.	15	13	7	10	5.1	
St. Paul	837	171	179	28.99	29.88	— .04	65.0	— 2.4	89	16	74	45	5	56	29	58	53	69	4.53	+ 0.2	14	6,382	se.	42	nw.	4	9	13	8	5.5	
La Crosse	714	71	87	29.13	29.89	— .04	66.0	— 2.2	92	17	76	45	1	56	32	...	...	...	2.44	— 2.0	11	4,761	s.	36	n.	24	5	14	11	6.4	
Madison	974	70	78	28.87	29.90	— .04	64.6	— 2.7	89	17	74	46	1	56	27	59	56	77	2.80	— 1.4	12	6,177	sw.	37	ne.	1	11	10	9	5.1	
Charles City	1,015	8	58	28.84	29.90	— .01	63.6	— 5.2	88	16	74	41	6	53	36	59	57	80	7.37	+ 2.2	13	4,945	se.	30	w.	30	4	14	12	6.2	
Davenport	606	71	79	29.25	29.90	— .04	67.9	— 3.0	90	17	77	47	5	59	26	62	59	75	2.07	— 2.3	12	5,236	sw.	34	w.	10	12	9	9	4.9	
Des Moines	861	84	101	29.01	29.90	— .02	67.2	— 3.2	91	16	76	47	2	58	31	60	56	71	4.13	— 1.2	11	5,980	sw.	31	nw.	4	7	17	6	5.8	
Dubuque	698	100	117	29.18	29.92	— .01	66.4	— 3.2	90	17	76	46	6	57	29	59	55	70	4.08	— 1.1	12	4,696	s.	24	s.	22	11	12	7	4.9	
Keokuk	614	64	77	29.24	29.91	— .03	69.1	— 3.4	90	30	79	47	5	59	27	62	59	74	6.40	+ 1.9	11	4,269	s.	30	w.	9	18	11	1	3.1	
Cairo	356	87	93	29.55	29.92	— .05	73.4	— 1.8	88	9	82	53	3	65	24	67	64	76	2.95	— 1.5	11	5,139	ne.	38	w.	23	8	13	9	5.2	
La Salle	536	56	64	29.35	29.91	— .04	67.2	— 2.9	91	17	77	47	2	57	34	...	...	...	3.45	.....	15	5,143	sw.	34	sw.	30	8	11	11	5.6	
Peoria	609	11	45	29.26	29.92	— .03	66.9	— 4.0	89	17	78	45	6	56	37	61	58	73	3.99	.....	13	5,175	sw.	33	w.	4	12	12	6	4.5	
Springfield, Ill.	644	10	92	29.23	29.91	— .04	69.6	— 2.7	90	18	80	49	3	59	27	62	59	71	3.29	— 1.2	14	5,783	s.	27	sw.	10	10	13	7	5.0	
Hannibal	534	75	109	29.33	29.89	— .06	69.2	— 4.1	90	18	79	45	6	59	29	...	...	...	3.31	0.0	12	6,189	sw.	35	sw.	10	9	13	8	5.1	
St. Louis	567	208	217	29.31	29.91	— .04	71.2	— 3.9	90	30	79	49	1	63	26	64	61	73	4.96	— 0.1	14	6,893	s.	50	ne.	1	7	10	13	5.8	
Missouri Valley.							69.8	— 2.2									69	4.62	+ 0.3										5.0	
Columbia, Mo	784	11	84	29.08	29.90	— .03	69.8	— 4.7	89	30	80	45	6	59	30	...	...	...	5.04	+ 0.2	16	5,130	s.	40	nw.	25	10	11	9	4.9	
Kansas City	963	78	95	28.90	29.91	— .01	72.0	— 1.0	91	24	81	49	1	63	27	64	60	70	6.16	+ 1.2	15	4,850	se.	36	nw.	24	11	14	5	4.6	
Springfield, Mo	1,324	98	104	28.53	29.91	— .04	70.6	— 1.7	87	13	80	47	2	61	27	64	60	73	5.75	+ 1.3	16	7,018	se.	34	nw.	25	14	11	5	3.8	
Iola	984	40	47	28.86	29.88	— .05	72.4	— 1.0	94	7	83	48	2	62	31	...	...	...	5.47	+ 0.7	13	5,561	s.	28	nw.	25	8	14	8	5.4	
Topeka	.....	85	89	.....	.....	.....	71.7	— 1.8	91	29	82	50	2	61	32	...	...	...	4.89	+ 0.1	14	6,402	s.	38	w.	9	18	8	4	3.4	
Lincoln	1,189	11	84	28.61	29.84	— .06	69.4	— 2.2	94	16	80	44	5	59	32	62	58	70	6.25	+ 2.0	11	7,330	se.	51	w.	24	10	15	5	4.5	
Omaha	1,105	115	121	28.71	29.87	— .04	69.4	— 2.2	94	16	78	47	5	61	25	62	57	69	4.69	— 1.0	11	6,136	s.	36	sw.	22	8	14	8	5.9	
Valentine	2,598	47	54	27.19	29.86	.00	65.2	— 1.9	96	15	77	38	1	54	41	56	50	64	2.74	— 0.7	8	8,045	s.	54	e.	13	12	16	2	4.4	
Sioux City	1,135	96	164	28.68	29.87	— .03	67.4	— 2.0	92	16	77	44	5	58	29	...	...	...	4.21	+ 0.4	10	9,035	se.	44	w.	23	7	14	9	5.7	
Pierre	1,572	70	75	28.21	29.85	— .02	66.6	— 2.3	95	15	77	39	5	56	36	58	52	63	1.22	— 2.2	11	7,559	se.	54	se.	13	13	9	8	4.9	
Huron	1,306	56	67	28.50	29.88	.00	64.2	— 2.4	89	15	74	38	5	54	32	58	54	73	2.88	— 0.7	15	8,155	se.	46	s.	16	16	8	12	5.6	
Yankton	1,233	49	57	28.55	29.85	— .04	66.4	— 3.0	92	15	76	41	5	57	31	...	...	...	6.08	+ 1.8	13	5,370	se.	31	nw.	4	5	11	14	6.6	
Northern Slope.							58.9	— 3.2									65	2.82	+ 0.3										5.0	
Havre	2,505	11	44	27.22	29.82	— .03	59.8	— 2.6	83	28	71	35	4	49	34	53	48	69	3.85	+ 0.8	16	6,021	sw.	36	sw.	12	12	16	2	4.3	
Miles City	2,371	26	48	27.35	29.86	+ .01	65.4	— 0.6	90	19	78	40	4	53	34	56	50	63	3.98	+ 1.0	15	4,265	ne.	31	n.	15	12	14	4	4.6	
Helena	4,110	8	56	25.74	29.88	.00	56.6	— 4.0	81	19	68	36	23	46	35	47	39	60	4.20	+ 1.8	11	5,230	w.	47	sw.	21	6	8	16	6.6	T.
Kalispell	2,962	8	34	26.84	29.86	— .03	56.0	— 2.8	80	28	67	35	14	44	33	48	44	71	3.01	+ 1.3	18	3,882	w.	25	s.	11	5	15	10	5.9	
Rapid City	3,234	46	50	26.52	29.87	— .02	61.6	— 2.2	83	28	72	41	5	51	37	55	50	67	3.24	— 0.6	13	5,198	w.	38	sw.	28	16	8	6	3.8	
Cheyenne	6,088	56	64	23.98	29.83	— .01	58.1	— 3.4	83	15	71	36	1	45	38	48	39	56	0.34	— 1.2	9	7,056	nw.	46	s.	15	11	16	3	4.5	
Lander	5,372	26	36	24.59	29.87	— .02	56.2	— 5.1	81	30	71	32	17	41	40	46	38	59	1.25	+ 0.1	9	3,180	w.	34	sw.	12	9	15	6	4.8	
Sheridan	3,790	5	...	26.02	29.86	.....	58.4	.....	84	29	73	35	10	44	44	...	...	...	0.26	.....	5	.....	nw.	...	...	...	10	10	10	5.8	
Yellowstone Park	6,200	11	48	23.84	29.89	+ .03	49.0	— 7.0	72	19	60	29	10	38	35	41	36	68	2.91	.....	19	5,296	s.	32	nw.	30	3	22	5	5.6	0.5
North Platte	2,821	11	51	26.99	29.86	.00	67.1	— 1.3	97	15	80	40	1	54	44	58	53	69	2.69	— 0.7	10	4,883	se.	30	nw.	3	16	8	6	3.9	
Middle Slope.							70.5	— 1.2									62	3.12	+ 0.1										4.4	
Denver	5,291	129	136	24.68	29.84	.00	64.0	— 2.4	88	29	77	42	1	51	37	50	40	49	1.15	— 0.2	7	5,525	s.	40	s.	15	14	12	4	4.2	
Pueblo	4,685	80	86	25.22	29.81	+ .02	67.0	— 1.0	96	29	81	41	1	53	42	52	40	46	0.47	— 0.8	5	5,245	se.	43	nw.	21	14	13	3	3.6	
Concordia	1,398	42	47	28.41	29.85	— .05	72.5	— 0.2	97	29	84	46	2	61	37	64	58	65	2.60	— 1.6	8	5,458	se.	24	se.	22	9	17	4	4.7	
Dodge	2,509	44	54	27.29	29.83	— .04	72.0	— 1.1	98	14	84	46	2	60	38	61	56	65	4.16	+ 0.8	8	7,595	se.	40	sw.	9	9	17	4	4.8	
Wichita	1,358	78	86	28.48	29.88	— .03	73.4	— 0.9	94	14	84	50	2	63	30	65	61	69	3.62	— 1.4	11	6,380	se.	30	sw.	23	11	13	6	4.9	
Oklahoma	1,214	10	47	28.60	29.84	— .07	74.2	— 1.5	90	14	83	52	2	65	26	68	65	75	6.71	+ 4.0	10	12,362	s.	50	sw.	24	13	14	3	4.2	
Southern Slope.							77.8	+ 0.6									56	1.50	— 1.3										3.4	
Abilene	1,738	45	54	28.07	29.82	— .06	81.4	+ 3.2	110	30	93	53	2	70	36	68	61	57	0.49	— 2.8	3	7,694	se.	31	s.	27	13	14	3	4.1	
Amarillo	3,676	10	49	26.18	29.82	— .03	71.6	— 0.4	104	29	86	44	1	57	44	60	53	62	1.97	— 1.1	5	9,585	s.	52	se.	3	21	7	2	3.1	
Del Rio	944	8	57	28.86	29.82	— .03	84.4	+ 2.3	106	30	97	54	2	72	40	...	...	...	1.00	.....	4	7,615	se.	38	e.	4	17	10	3	3.5	
Roswell	3,578	9	57	26.22	29.76	— .04	73.6	— 2.7	104	29	91	47	7	56	47	58	47	50	2.03	0.0	5	4,319	sw.	30	sw.	8	20	8	2	3.1	
Southern Plateau.							70.0	— 4.6									35	0.49	+ 0.2										1.7	
El Paso	3,762	10	110	26.09	29.75	.00	77.4	— 2.2	102	29	92	54	9	62	39	54	32	26	0.76	+ 0.4	3	7,890	nw.	50	sw.	19	25	5	0	1.7	
Santa Fe	7,013	33	39	23.26	29.79	— .02	60.6	— 5.6	86	29	74	40	1	48	37	47	35	42	1.14	+ 0.2	6	5,175	ne.	35	nw.	2	22	6	2	2.2	
Flagstaff	6,907	12	44	23.35	29.82	+ .04	54.2	— 5.1	86	28	71	24	16	37	49	40	27	44	0.51	0.0	3	6,780	sw.	38	sw.	12	21	7	2	2.5	0.5
Phoenix	1,108	50	56	28.64	29.76	+ .02	80.8	— 3.6	111	30	97	54	16	65	46	57	35	24	T.	— 0.1	0	3,402	e.	21	w.	8	26	3	1	1.4	
Yuma	141	16	46	29.62	29.76	+ .02	80.0	— 4.7	113	28	96	55	16	64	46	60	46	38	0.00	0.0	0	4,949	w.	25	nw.	12	30	0	0	0.2	
Independence	3,910	11	42	25.90	29.80	+ .02	67.2	— 6.2	93	27	80	36	14	54	37	50	34	35	0.55	+ 0.5	3	5,690	nw.	28	nw.	21	25	3	2	2.4	
Middle Plateau.							59.7	— 4.8									48	0.91	+ 0.4										3.6	
Reno	4,532	56	63	25.43	29.90	+ .04	57.2	— 3.8	86	26	72	33	15	43	40	45	35	54	0.63	+ 0.4	6	4,571	w.	34	n.	21	18	9	3	3.2	T.
Tonopah	6,089	12	20	24.02	29.89	.....	59.2	— 1.0	86	27	71	27	14	48	34	45	31	42	0.58	.....	5	6,333	nw.	37	nw.	21	12	12	6	4.4	T.
Winnemucca	4,344	18	56	25.56	29.90	+ .02	58.6	— 4.7	90	27	73	33	14	44	38	46	37	55	1.16	+ 0.4	11	4,251	sw.	36	nw.	21	18	8	4	3.1	T.
Modena	5,479	10	43	24.56	29.83	+ .01	58.2	— 5.0	90	28	73	32	13	43	45	44	32	46	0.50	+ 0.3	9	9,072	sw.	52	sw.	12	11	10	9	4.6	
Salt Lake City	4,366	105	110	25.56	29.88	+ .03	60.2	— 8.1	86	28	71	37	15	50	33	49	40	54	1.49	+ 0.7	12	4,638	nw.	36	nw.	12	11	7	12	4.9	
Durango	6,546	18	56	23.64	29.83	+ .01	57.7	— 5.0	86	29	74	34	9	41	42	44	31	49	1.08	+ 0.3	5	4,681	nw.	34	nw.	3	15	10	5	3.8	
Grand Junction	4,608	43	51	25.30	29.83	.00	66.8	— 5.8	93	28	81	43	16	53	38	49	33	38	0.60	+ 0.2	5	4,580	nw.	30	s.	22	18	7	5	3.5	
Northern Plateau.							60.1	— 4.6									56	1.61	+ 0.4										5.7	
Baker City	3,471	48	58	26.39	29.95	.00	55.4	— 3.2	87	27	66	34	14	44	35	46	39	59	1.35	— 0.2	7	4,420	nw.	26	s.	11	7	13	10	5.6	
Boise	2,739	78	86	27.09	29.92	+ .01	60.8	— 5.2	90	27	72	39	13	50	32	49	40	54	2.40	+ 1.6	9	4,252	nw.	33	s.	4	8	11	11	5.9	
Lewiston	757	10	51	29.09	29.89	— .05	64.2	— 4.9	93	26	75	42	13	53	37	...	...	...	1.48	+ 0.3	11	4,114	e.	39	w.	28	7	7	16	6.3	
Pocatello	4,477	46	54	25.43	29.90	+ .03	57.5	— 6.7	82	27	69	34	15	46	37	46	38	56	1.89	+ 0.8	13	5,930	se.	32	sw.	11	13	14	3	4.4	
Spokane	1,929	101	110	27.88	29.91	— .03	60.5	— 2.9	88	26	71	41	15	50	35	50	41	56	0.96	— 0.7	7	5,477	s.	29	sw.	15	5	16	9	6.5	
Walla Walla *	1,000	71	79	.....	.....	.....	.....	.....	...	...	...	...	...	...	...	...	...	...	.....	.....	...	.....	...	...	...	...	...	...	...	.....	
N. Pac. Coast Reg.							57.1	— 0.5									76	1.33	— 0.8										6.1	
North Head	211	11	56	29.80	30.03	+ .04	53.5	— 1.5	61	7	56	45	12	50	10	51	50	87	2.02	— 0.6	16	12,102	nw.	48	se.	9	4	10	16	6.6	
Port Crescent	259	12	29	29.76	30.04	+ .01	51.2	— 2.2	66	25	58	35	13	44	23	...	...	...	0.70	— 0.9	9	3,368	w.	12	w.	20	8	10	12	6.3	
Seattle	123	185	224	29.89	30.02	+ .02	59.4	— 0.7	83	26	68	45	13	51	28	53	47	70	0.78	— 0.8	7	5,388	s.	47	sw.	11	7	9	14	6.1	
Tacoma	213	113	120	29.78	30.00	— .03	59.8	+ 0.4	86	26	69	43	13	51	29	...	...	...	1.22	— 0.6	8	4,808	sw.	36	sw.	11	9	7	14	6.0	
Tatoosh Island	86	7	57	29.92	30.02	.00	51.7	— 1.3	59	17	55	45	2	48	12	50	48	88	1.90	— 2.1	12	7,615	sw.	46	w.	19	4	1	25	8.2	
Portland, Oreg.	158	68	106	29.84	29.99	— .05	62.6	+ 1.3	91	26	72	46	12	54	30	55	49	67	1.84	0.0	10	4,528	nw.	30	s.	12	11	13	6	4.5	
Roseburg	510	9	57	29.46	30.01	— .02	61.3	+ 0.4	97	26	74	39	12	49	42	53	48	69	0.88	— 0.4	8	2,667	n.	21	sw.	12	10	7	13	5.1	

TABLE I.—*Climatological data for U. S. Weather Bureau stations, June, 1907*—Continued.

Stations.	Elevation of instruments.			Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.								Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.			Wind.				Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness during daylight, tenths.	Total snowfall.
	Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Actual, reduced to mean of 24 hours.	Sea level, reduced to mean of 24 hrs.	Departure from normal.	Mean max. + mean min. ÷ 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.				Total.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.				
Mid. Pac. Coast Reg.							62.1	— 2.1									67	0.98	+ 0.6									4.4	
Eureka	62	62	80	29.97	30.04	— .01	54.4	— 0.2	62	10	58	45	14	51	12	51	49	84	0.58	- 0.6	9	5,342	nw.	39	n.	20	7	14	9	5.7	
Mount Tamalpais	2,375	11	18	27.51	29.97	+ .02	59.3	.....	84	18	66	40	14	52	32	50	42	59	1.44	+ 1.3	6	10,106	nw.	60	nw.	21	24	1	5	2.3	
Point Reyes Light	490	7	18	29.42	29.94	. ....	53.2	.....	67	17	57	47	26	49	18	....	....	....	1.09	+ 0.7	7	15,941	nw.	84	nw.	21	8	6	16	6.6	
Red Bluff	332	50	56	29.53	29.88	.00	70.7	— 5.0	101	19	83	44	14	58	36	58	48	51	1.18	+ 0.7	8	3,779	se.	19	n.	20	15	8	7	4.5	
Sacramento	69	106	117	29.84	29.91	+ .02	66.4	— 2.5	95	18	78	47	14	55	35	56	49	61	0.85	+ 0.7	2	6,483	s.	30	sw.	21	23	5	2	2.1	
San Francisco	155	200	204	29.80	29.97	+ .01	57.1	+ 0.1	85	17	63	48	26	51	29	52	49	81	1.28	+ 1.0	6	6,857	w.	32	w.	21	10	14	6	4.3	
San Jose	141	78	88	29.82	29.97	.....	62.0	— 3.0	92	18	74	42	15	50	42	....	....	....	0.42	+ 0.2	2	.....	nw.	...	.....	...	23	6	1	2.5	
Southeast Farallon	30	9	17	29.95	29.98	.....	53.4	.....	.....	59	5	55	48	26	51	8	....	....	....	0.96	.....	6	12,158	nw.	48	nw.	21	6	7	17	6.9	
S. Pac. Coast Reg.							65.1	— 1.0									66	0.12	0.0									3.3	
Fresno	330	67	70	29.54	29.89	+ .04	72.0	— 3.8	101	27	88	42	14	56	43	55	41	43	0.24	+ 0.1	1	4,580	nw.	21	nw.	14	25	4	1	1.7	
Los Angeles	338	116	123	29.56	29.93	+ .03	65.0	+ 0.5	92	29	75	50	18	55	34	57	52	71	0.03	— 0.1	2	4,460	sw.	34	sw.	14	18	4	8	3.7	
San Diego	87	94	102	29.84	29.93	+ .01	62.9	— 0.9	80	30	68	52	15	58	21	57	54	75	0.19	+ 0.1	4	4,772	nw.	24	nw.	15	23	2	5	3.3	
San Luis Obispo	201	47	54	29.76	29.98	+ .03	60.4	0.0	92	17	71	41	13	50	39	53	49	76	0.02	— 0.1	2	4,080	nw.	24	w.	14	14	10	6	4.4	
West Indies.																															
Grand Turk	11	6	20	30.00	30.01	.00	83.2	.....	91	*	80	72	*	77	....	....	....	....	0.51	.....	7	.....	se.	....	.....	....	....	....	....	....	
San Juan	82	48	90	29.92	30.00	+ .01	79.9	.....	91	2	86	68	13	74	17	75	72	78	6.08	+ 1.2	16	8,518	e.	36	se.	22	16	10	4	4.8	
Panama.																															
Ancon	74	....	....	.....	29.84	.....	79.8	.....	95	6	87	70	12	73	24	....	....	....	12.64	.....	22	.....	.....	...	.....	...	0	5	25	....	
Bas Obispo	40	....	....	.....	29.84	.....	77.8	.....	90	6	84	67	29	72	20	....	....	....	8.67	.....	22	2,773	nw.	20	w.	20	0	4	26	....	
Naos	.....	....	....	.....	29.84	.....	79.8	.....	92	6	85	71	12	74	18	....	....	....	10.62	.....	19	5,078	nw.	26	ne.	11	0	7	23	...	

* Record incomplete.

TABLE II.—*Climatological record of cooperative observers, June, 1907.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Alaga	....	....	....	4.32	
Ashville	94	50	74.4	1.85	
Auburn	91	56	75.6	3.16	
Bermuda	95	54	76.7	3.65	
Boligee	95	53	77.0	2.14	
Bridgeport	....	....	....	2.93	
Burkville	....	....	....	2.66	
Camp Hill	98[a]	54[b]	74.8[f]	2.56	
Cedar Bluff	....	....	....	2.56	
Citronelle	94	55	77.8	1.91	
Clanton	95	52	75.4	4.14	
Cordova	92	51	74.8	2.93	
Dadeville	....	....	....	3.84	
Daphne	93	60	77.8	T.	
Decatur	99	50	75.5	3.07	
Demopolis	....	....	....	2.99	
Eufaula	94	55	76.2	3.10	
Evergreen	99	56	78.6	4.37	
Flomaton	92	55	78.0	1.11	
Florence	94	49	74.2	4.08	
Fort Deposit	97	55	78.8	1.42	
Gadsden	94	52	75.0	1.76	
Goodwater	94	52	75.5	4.28	
Greensboro	94	56	77.2	2.63	
Guntersville	....	....	....	3.02	
Hamilton	92[f]	46[f]	72.6[f]	2.92	
Highland Home	97	56	76.6	2.74	
Letohatchee	....	....	....	0.60	
Livingston	95	55	76.4	5.82	
Lock No. 4	95	51	74.9	1.70	
Lucy	95	55	76.8	8.31	
Madison Station	92	50	73.4	5.40	
Maplegrove	94	49	73.0	2.74	
Milstead	....	....	....	1.14	
Newbern	95	54	76.8	4.82	
Oneonto	92	48	72.9	2.59	
Opelika	98	55	75.4	3.51	
Ozark	97	47	77.4	1.45	
Prattville	94	57	76.3	4.68	
Pushmataha	96	54	76.8	2.09	
Riverton	92	41	72.2	2.53	
Scottsboro	91	47	71.5	4.37	
Selma	98	53	78.4	2.17	
Spring Hill	90	65	78.5	3.44	
Talladega	96	58	75.4	2.41	
Tallassee	....	....	....	2.76	
Thomasville	94	54	76.8	4.49	
Tuscaloosa	97	52	76.0	2.20	
Tuscumbia	95	54	75.6	3.47	
Tuskegee	96	55	77.2	0.45	
Union Springs	95	57	77.2	3.80	
Uniontown	95	54	76.6	2.03	
Valleyhead	94	42	70.8	2.99	
Vienna	....	....	....	2.67	
Wetumpka	100	55	76.8	3.47	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alaska.	°	°	°	*Ins.*	*Ins.*
Dutch Harbor	67	34	47.1	1.27	
Fairbanks	80	41	57.8	.....	
Fort Egbert	80[d]	34	57.2[b]	1.89	
Juneau	74	38	55.0	.....	
Katala	79	41	49.5	8.29	
Killisnoo	67	40	51.1	3.85	
Nome	65	30	45.5	1.31	
North Fork	78	30	52.2	1.92	
Rampart	83	34	57.2	1.64	
St. Michael	61	35	48.1	.....	
Sitka	63	35	49.8	3.66	
Tonsina	90	33	57.9	.....	
Arizona.					
Allaire Ranch	....	....	....	T.	
Arizona Canal Co. Dam	114	59	81.0	0.25	
Aztec	124	56	89.2	0.00	
Benson	103	45	74.8	0.00	
Bisbee	95	45	70.4	T.	
Bonita	....	....	....	0.00	
Bowie	107	48	75.2	0.00	
Buckeye	112	43	77.2	0.01	
Casa Grande	119	40	79.5	0.50	
Clifton	....	....	....	0.26	
Cline	105	45	72.4	0.26	
Cochise[e1]	98	60	80.2	0.00	
Columbia	106	44	74.6	0.20	
Congress	104	54	77.7	T.	
Douglas	106	44	74.8	0.00	
Dudleyville	104	45	74.2	0.03	
Fish Creek	....	....	....	0.06	
Fort Apache	98	36	64.0	0.18	
Fort Huachuca	98	38	69.0	T.	
Fort Mohave	116	55	83.2	T.	
Fredonia	103	36	66.0	T.	
Gilabend	115	54	81.8	0.00	
Globe	104	45	74.2	0.10	
Grand Canyon	96	32	56.8	0.20	
Greaterville	100	42	70.6	0.00	
Holbrook	101	35	66.2	0.54	
Huachuca Reservoir	....	....	....	0.00	
Intake	....	....	....	T.	
Jerome	98	45	73.4	0.20	
Keams Canyon	90	35	59.8	0.56	
Kingman	106	40	71.7	0.14	
Maricopa	117	49	79.8	0.00	
Mesa	113	50	79.8	0.03	
Mohawk Summit	119	60	90.2	0.00	
Natural Bridge	....	....	....	0.53	
Nutrioso	....	....	....	0.67	
Oracle	98	51	73.8	0.14	
Parker	119	47	79.4	0.00	
Phoenix (Ex. Farm)	112	47	78.7	T.	
Picacho[e5]	110	74	91.8	T.	
Pinal Ranch	....	....	....	0.22	
Pinto	....	....	....	0.98	
Prescott	95	30	62.6	0.50	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Arizona—Cont'd.	°	°	°	*Ins.*	*Ins.*
Roosevelt	112	50	80.6	0.22	
St. Johns	95	29	62.8	0.30	
St. Michaels	91	34	59.9	0.34	
San Carlos	109	45	75.4	0.06	
San Simon	106	40	73.4	T.	
Seligman	96	28	61.3	0.00	
Sentinel	118	55	84.0	0.00	
Silverbell	106	57	80.8	0.00	
Tempe	113	46	78.5	0.43	
Thatcher	103	42	73.0	T.	
Tombstone	101	51	74.1	0.00	
Tucson	107	50	78.0	T.	
Upper San Pedro	106	42	72.0	T.	
Vail [e5]	100	60	80.5	0.00	
Walnut Grove	....	....	....	T.	
Willcox	102	42	70.6	0.05	
Williams	89	29	57.4	0.20	
Yarnell	....	....	....	0.06	
Arkansas.					
Alicia	92	52	73.3	2.39	
Amity	91	50	75.3	5.37	
Arkadelphia	92	53	76.8	3.40	
Arkansas City	....	....	....	3.50	
Batesville	96	53	75.5	3.58	
Beebranch	93	51	75.0	3.70	
Benton	96	52[b]	77.6[e]	2.33	
Bergman	95	42	70.1	6.94	
Booneville	....	....	....	3.10	
Brinkley	97	54	77.2	3.49	
Camden	92	51	76.2	5.24	
Center Point	95	50	77.7	5.62	
Clarendon	....	....	....	1.40	
Conway	92	51	75.2	2.49	
Corning	88	51	73.4	5.29	
Dardanelle	....	....	....	4.20	
Des Arc	93	52	75.8	3.89	
Dodd City	98	44	73.0	5.60	
Dutton	85	45	69.3	10.38	
Eldorado	95	53	78.2	3.42	
England	94	53	77.4	2.15	
Eureka Springs	93	45	72.8	7.12	
Fayetteville	90	47	72.4	6.74	
Forrest City	93	54	75.0	3.32	
Fulton	....	....	....	2.10	
Hardy	90	50	72.1	5.19	
Heber	96	46	76.8	5.79	
Helena	92	54	76.4	2.25	
Hope	95	52	78.4	3.01	
Hot Springs	92	47	74.6	3.75	
Jonesboro	93	48	73.8	6.19	
Junction	95	50	77.8	3.62	
La Crosse	103	51	76.0	5.18	
Lewisville	95[d]	50[d]	77.3[d]	2.11	
Lutherville	93	47	73.6	3.57	
Luxora	....	....	....	3.98	
Malvern	91	50	74.0	5.45	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Arkansas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Mammoth Spring	89	45	71.4	5.63	
Marked Tree	.....	.....	.....	4.03	
Marvell	93	53	76.1	2.03	
Mena	90	50	74.4	5.18	
Montrose	94	51	76.8	4.32	
Mossville	85	45	72.8	5.88	
Mount Nebo	87	53	74.5	3.08	
Newport	96	52	76.6	6.61	
Ozark	94	49	75.1	4.20	
Pine Bluff	94	52	76.4	3.99	
Pocahontas	92	50	74.3	4.45	
Pond	90	39	73.1	7.88	
Prescott	95	52	77.8	5.37	
Princeton	94	49	76.4	4.73	
Rogers	88	46	71.3	6.82	
Russellville	98	51	77.4	5.31	
Spielerville	98[e]	52[e]	77.0[e]	3.53	
Stuttgart	93	51	75.4	1.63	
Texarkana	97	59	81.6	2.40	
Warren	95	51	77.5	6.52	
Wiggs	92	46	74.4	4.64	
Winchester	96	53	77.0	6.51	
California.					
Alturas	87	31	55.8	1.68	
Angiola	107	35	69.0	0.00	
Auburn	91	43	65.8	1.79	
Azusa	101	42	65.4	0.22	
Bagdad	113	61	85.4	0.00	
Bakersfield	105	38	71.8	0.00	
Bear Valley	.....	.....	.....	5.78	8.0
Berkeley	86	44	60.6	1.24	
Bishop	90	35	62.4	T.	
Blocksburg	90	32	60.6	1.64	
Blue Canyon	81	30	58.6	4.59	6.0
Branscomb	89	33	56.4	3.13	
Brush Creek	92	36	61.8	3.53	
Butte Valley	.....	.....	.....	3.18	2.0
Calexico	112	58	80.0	0.00	
Campbell	94	39	61.8	0.50	
Campo	.....	.....	.....	0.26	
Cedarville	91	27	55.4	1.99	
Chico	103	41	70.2	0.84	
Claremont	104	45	67.5	0.45	
Cloverdale	100	43	66.2	0.62	
Colusa	94	52	73.4	0.33	
Crescent City	66	42	55.0	3.06	
Crockers	.....	.....	.....	1.64	
Cuyamaca	82	31	54.8	0.87	
Delta	94	40	65.9	0.91	
Dimond	.....	.....	.....	1.38	
Dobbins	97	41	68.7	3.08	
Durham	99	41	69.6	0.63	
Elcajon	106	42	67.7	0.25	
Electra	97	46	70.6	1.56	
Elmwood	100	40	69.5	0.76	
Elsinore	107	38	69.0	0.05	
Emigrant Gap	82	18	54.2	4.70	11.0
Escondido	104	35	65.8	0.19	
Folsom	101	42	69.6	0.91	
Fordyce	.....	.....	.....	5.19	21.0
Fort Ross	70	43	57.8	1.36	
Georgetown	89	34	62.2	3.07	
Gold Run	85	30	61.8	3.10	
Grass Valley	.....	.....	.....	4.40	
Greenville	87	32	57.1	2.91	T.
Groveland	.....	.....	.....	1.55	
Hanford	108	36	68.5	0.00	
Healdsburg	91[e]	41[e]	66.0[e]	0.73	
Heber	119	53	81.2	0.00	
Hollister	96	42	61.9	0.49	
Idyllwild	89	28	55.9	0.43	
Indio	117	55	83.8	0.00	
Iowa Hill	86	34	61.8	4.20	
Isabella	.....	.....	.....	0.10	
Jamestown	98	35	65.2	0.87	
Jolon	.....	.....	.....	0.17	
Kennedy Gold Mine	.....	.....	.....	1.81	
Kentfield	.....	.....	.....	1.65	
Kernville	.....	.....	.....	0.11	
King City	100	40	62.0	0.00	
Laporte	78	26	52.0	4.28	5.0
Le Grande	106	40	74.2	T.	
Lemoncove	103	40	72.6	T.	
Lick Observatory	78	34	57.6	0.92	
Livermore	99	42	64.8	0.56	
Lodi	95	43	66.8	1.61	
Lone Pine	94	40	66.0	0.04	
Los Gatos	95	43	63.0	0.87	
Lowe Observatory	.....	.....	.....	0.94	
Magalia	92	33	60.4	3.48	
Mammoth	121	51	81.7	0.00	
Marysville	102	46	79.4	0.00	
Merced	99	42	70.3	0.17	
Mercury	.....	.....	.....	0.96	
Milo	.....	.....	.....	0.30	
Milton (near)	98	45	68.8	1.17	
Mokelumne Hill	92	40	65.6	1.45	
Mono Ranch	93	35	59.8	0.01	
Montague	92	31	62.3	0.71	
Monterio	94	34	60.0	0.35	
Monumental	87	32	57.2	4.49	1.0
Mount St. Helena	.....	.....	.....	1.33	
Napa	95	47	62.8	0.85	
Needles	109	53	80.6	0.00	
Nevada City	89	31	59.8	3.05	
New Castle	98	41	69.6	1.34	
Newman[4]	104	43	72.2	0.40	
Nimshew	94	34	63.2	2.80	
North Bloomfield	86	31	58.8	5.54	
Oakland	86	48	62.2	1.30	
Ojai Valley	100	39	64.0	0.12	
Orland	107	41	73.8	0.53	
Orleans	102	41	70.2	1.99	
Oroville (near)	98	45	70.6	1.41	
Ozena	.....	.....	.....	0.00	
Palermo	99	44	69.3	1.42	
Pilot Creek	.....	.....	.....	4.57	
Pine Crest	95	49	64.4	0.51	
Placerville	90	36	62.2	2.35	
Point Lobos	75	51	58.8	1.10	
Porterville	102	41	71.3	0.16	
Poway	107	38	68.9	0.20	
Priest Valley	.....	.....	.....	0.09	
Quincy	84	31	56.1	3.55	T.
Redding	97	41	70.4	1.49	
Redlands	103	47	67.8	0.61	
Reedley	103	41	71.8	0.00	
Represa	.....	.....	.....	1.06	
Rialto	99	46	67.4	1.16	
Riverside	103	44	68.0	0.16	
Rocklin	97	41	68.5	1.17	
Sacramento	88	44	65.2	0.80	
Salinas	94	41	61.6	0.08	
San Bernardino	106	43	68.3	0.25	
San Jacinto	106	45	69.6	0.00	
San Miguel	.....	.....	.....	0.00	
Santa Barbara	90	45	62.8	0.16	
Santa Clara College	95	41	62.8	0.47	
Santa Cruz	93	40	60.6	1.10	
Santa Maria	86[5]	48[5]	62.6[5]	0.04	
Santa Monica	79	48	59.9	T.	
Santa Rosa	93	39	61.7	1.00	
Sausalito	.....	.....	.....	1.44	
Shasta	104	45	74.0	0.41	
Sierra Madre	98	50	66.0	0.55	
Sisson	95	32	60.6	1.08	
Sonora	93	46	67.4	0.86	
Stirling	87	32	59.8	2.20	
Stockton	94	44	66.6	0.74	
Storey	100	37	67.8	T.	
Summerdale	79	26	55.3	1.44	1.0
Summit	72	16	44.0	2.22	19.0
Susanville	92	33	59.0	1.76	T.
Tamarack	69	2	38.0	6.39	52.0
Towle	84	31	57.7	4.17	
Truckee	74	36	54.4	0.58	
Tulare	97	38	68.8	T.	
Tustin (near)	.....	.....	.....	0.15	
Ukiah	97	41	64.5	0.98	
Upperlake	97	40	65.6	0.65	
Upper Mattole	.....	.....	.....	1.67	
Vacaville	98	42	66.2	0.88	
Visalia	100	35	65.2	0.00	
Wasioja	.....	.....	.....	0.00	
Westpoint	.....	.....	.....	2.35	
Wheatland	97	44	68.9	1.11	
Willits	.....	.....	.....	2.00	
Willows	98	45	70.8	0.70	
Woodleaf	.....	.....	.....	3.75	
Woodside	92	41	61.6	0.60	
Yosemite	91	28	58.8	3.13	
Colorado.					
Akron	.....	.....	.....	3.26	
Alamosa	86[j]	33[j]	56.6[j]	0.22	
Arriba	90	32	61.7	1.28	
Ashcroft	77[g]	25[g]	49.2[g]	1.46	
Blaine	99	40	67.6	1.66	
Boulder	89	46	63.8	0.59	
Breckenridge	73	25	47.2	0.42	
Buena Vista	79	32	53.4	0.32	
Burlington	96	36	66.8	1.60	
Calhan	84	34	58.8	1.26	
Canyon	95	45	68.2	0.36	
Castlerock	87	31	57.2	0.82	
Cheesman	88	33	58.8	0.52	
Cheyenne Wells	95	38	66.2	2.86	
Chromo	83	22	53.0	1.36	
Collbran	88	31	59.0	1.05	
Colorado Springs	.....	.....	.....	0.54	
Cope	94	33	66.3	2.30	
Corona	56	20	37.0	0.64	4.0
Cripplecreek	.....	.....	.....	0.39	
Delta	93	38	65.0	0.56	
Dunkley	77[f]	25[f]	51.3[f]	.....	
Eads	96	37	68.8	1.45	
Eagle	84	31	54.0	0.46	
Eureka	.....	.....	.....	1.77	
Fort Collins	88	34	60.9	0.44	
Fort Morgan	92	35	65.0	1.44	
Fowler	.....	.....	.....	1.08	
Frances	80	30	53.6	0.68	
Garnett	87	30[l]	55.7[e]	0.45	
Gladstone	.....	.....	.....	1.76	3.3
Gleneyre	.....	.....	.....	0.89	
Glenwood	84	33	58.0	0.68	
Gothic	70[k]	26	46.0[d]	1.60	T.
Grand Valley	89	37	60.9	0.90	
Greeley	92[b]	32[e]	63.7[b]	0.51	
Gunnison	82	23	51.6	0.74	
Hamps	88	31	60.4	0.66	
Hoehne	101	30	62.1	1.18	
Holly	99	40	69.2	1.54	
Holyoke (near)	96	34	65.6	4.80	
Idaho Springs	81	33	56.2	0.23	
Lake City	78	29	50.8	1.33	T.
Lake Moraine	71	26	48.0	0.26	
Lamar	100	41	70.2	1.18	
Laporte	.....	.....	.....	1.54	
Las Animas	99	40	69.7	1.30	
Lay	84	22	52.8	0.65	
Leroy	89	36	63.4	2.67	
Limon	89	34	61.5	1.12	
Longs Peak	71	23	47.7	0.86	
Lujane	88	36	60.2	1.09	
Manassa	80	30	54.0	0.80	T.
Mancos	84	30	55.9	1.38	
Meeker	84	26	54.0	1.04	
Moraine	74	27	52.0	.....	
Pagoda	89	27	54.3	0.57	
Pagosa Springs	83	28	54.5	1.66	
Paonia	93	38	62.8	0.93	
Platte Canyon	.....	.....	.....	0.72	
Power House	83	32	55.4	3.28	
Rangely	82	25	55.5	0.58	
River Portal	87	37	59.7	1.67	
Rockyford	94	38	67.8	0.69	
Saguache	85	30	55.8	1.00	
Salida	84	32	57.1	0.15	
San Luis	81	29	54.3	0.29	
Santa Clara	86	35	56.8	1.73	
Sapinero	75	25	49.8	2.74	T.
Sheridan Lake	97	30	68.2	2.71	
Silt	86	36	60.4	0.58	
Silverton	73	27	46.8	1.45	
Stonewall	.....	.....	.....	0.69	
Terminal Dam	.....	.....	.....	1.54	
Trinidad	94	36	64.2	0.40	
Victor	74	28	52.6	0.48	T.
Vilas	.....	.....	.....	3.50	
Wagon Wheel Gap	78	23	47.6	0.40	4.0
Waterdale	87	35	60.5	0.45	
Westcliffe	84	29	55.8	0.67	
Whitepine	70	25	45.5	.....	
Wray	95	37	68.0	1.53	
Yuma	.....	.....	.....	2.44	
Connecticut.					
Bridgeport	88	40	64.1	3.02	
Canton	92	38	62.6	4.18	
Colchester	86	38	61.6	2.67	
Falls Village	.....	.....	.....	4.19	
Hawleyville	87	35	62.4	4.91	
New London	86	41	63.2	3.06	
North Grosvenor Dale	92	36	63.0	3.04	
Norwalk	90	37	63.7	3.56	
Southington	88	35	62.7	3.55	
South Manchester	.....	.....	.....	2.78	
Storrs	87	35	62.0	2.81	
Voluntown	90	33	62.5	2.15	
Waterbury	91	37	63.8	4.37	
West Cornwall	90	37	62.3	4.23	
West Simsbury	.....	.....	.....	3.30	
Delaware.					
Delaware City	.....	.....	.....	5.86	
Dover	91	45	66.4	5.66	
Milford	94	44	66.8	4.88	
Millsboro	93	45	64.6	6.04	
Newark	89	43	65.2	5.72	
Seaford	87	46	65.0	4.50	
District of Columbia.					
West Washington	92	46	66.3	5.56	
Florida.					
Apalachicola	90	62	78.4	7.20	
Archer	101	57	79.3	7.55	
Avon Park	96	62	79.4	9.43	
Bartow	98	58	80.2	4.75	
Bonifay	95	56	77.5	5.17	
Brooksville	99	62	79.0	8.89	
Carrabelle	90	58	77.6	3.40	
Clermont	100	64	80.5	8.40	
De Funiak	94	54	77.4	5.19	
Eustis	98	62	79.8	5.47	
Federal Point	97	59	78.8	4.18	
Fenholloway	98	55	77.4	6.25	
Fernandina	96	62	78.5	4.43	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Florida—Cont'd.	°	°	°	*Ins.*	*Ins.*
Flamingo	92	67	81.0	5.61	
Fort Meade	97	60	78.6	5.99	
Fort Myers	93	64	79.5	6.76	
Gainesville	100	58	80.6	4.35	
Galt	96	55	79.0	2.21	
Grasmere	98	63	80.8	.....	
Huntington	99	60	79.7	4.54	
Hypoluxo	94	65	79.4	10.80	
Jasper	95	57	78.6	7.31	
Johnstown	96	53	77.8	.....	
Kissimmee	96	62	80.0	6.91	
Lake City	97	57	78.4	7.41	
Macclenny	96	56	76.8	3.26	
Madison	99	59	79.5	5.30	
Malabar	95	59	79.2	7.18	
Manatee	98	59	78.8	8.11	
Marianna	96	55	77.6	2.18	
Merritts Island	93	68	79.8	6.96	
Miami	92	65	79.6	8.47	
Molino	.....	.....	.....	4.66	
Monticello	94[e]	63[e]	78.3[e]	5.52	
Mount Pleasant	96	54	77.2	5.54	
New Smyrna	97	59	78.5	2.97	
Ocala	98	60	79.5	4.61	
Orange City	98	56	78.2	5.32	
Orlando	100	62	80.4	8.17	
Panasoffkee	96	56	77.4	6.56	
Rockwell	100[e]	60[e]	79.6[e]	3.93	
St. Andrew	94	57	79.2	3.02	
St. Augustine	96	61	78.0	3.83	
St. Leo	97	61	79.0	8.47	
Switzerland	96	59	77.8	3.97	
Tallahassee	93	58	78.4	6.58	
Tarpon Springs	95	60	77.9	5.25	
Titusville	98[e]	59[e]	78.8[e]	.....	
Wausau	95	56	77.9	5.85	
Georgia.					
Abbeville	.....	.....	.....	4.05	
Adairsville	90	54	73.8	2.19	
Albany	99	57	80.6	3.36	
Allapaha	100	56	78.0	5.61	
Americus	97	55	78.1	1.24	
Athens	92	57	75.0	2.45	
Bainbridge	99	56	78.2	5.52	
Blakely	100	55	79.4	2.92	
Bowersville	91	55	74.4	2.11	
Brunswick	99	61	79.2	5.75	
Butler	.....	.....	.....	4.14	
Camak	94	54	74.7	4.63	
Canton	.....	.....	.....	6.56	
Clayton	87	43	68.4	5.28	
Columbus	97[e]	53[e]	78.4[e]	3.37	
Covington	93[e]	54[e]	75.2[e]	7.02	
Cuthbert	.....	.....	.....	2.43	
Dahlonega	92	48	71.1	3.05	
Dawson	101	55	81.6	2.65	
Diamond	85	46	67.8	4.16	
Dublin	.....	.....	.....	5.52	
Dudley	97	56	78.1	7.25	
Eastman	101	50	80.4	2.09	
Eatonton	96	52	76.4	2.26	
Elberton	94	52	75.0	5.32	
Experiment	98	56	75.5	3.06	
Fitzgerald	98	51	77.8	6.10	
Fleming	102	55	78.0	12.60	
Forsyth	97	51	77.6	.....	
Fort Gaines	98	58	78.4	2.13	
Gainesville	90	54	73.4	3.25	
Gillsville	91	52	73.4	2.18	
Glenville	98	62	78.7	7.76	
Greenbush	88	52	71.9	3.00	
Greensboro	96	53	76.5	6.12	
Griffin	94	54	76.0	4.69	
Harrison	96	53	75.6	4.11	
Helena	95	50	77.8	6.42	
Lisbon	98	51	76.3	4.51	
Lost Mountain	93	48	73.6	2.87	
Louisville	96	36	76.8	5.79	
Lumpkin	94	52	74.9	2.61	
Marshallville	98	53	77.6	6.03	
Mauzy	98	57	78.9	6.70	
Milledgeville	99	53	77.5	2.47	
Millen	100	54	78.0	3.79	
Montezuma	.....	.....	.....	3.68	
Monticello	97	56	76.6	4.15	
Morgan	94	56	77.2	3.55	
Newnan	98	54	75.3	2.08	
Oakdale	.....	.....	.....	1.76	
Point Peter	95	49	75.6	5.41	
Poulan	.....	.....	.....	3.51	
Putnam	99	53	77.8	2.19	
Quitman	97	60	78.5	6.69	
Ramsey	92	50	73.6	6.82	
Resaca	.....	.....	.....	1.55	
Rome	95	50	73.8	3.18	
St. George	94	60	77.4	4.85	
St. Marys	101	59	78.6	4.40	
Screven	94[d]	56	76.4[b]	10.98	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Georgia—Cont'd.	°	°	°	*Ins.*	*Ins.*
Statesboro	99	58	77.8	4.09	
Talbotton	99	52	76.4	4.40	
Tallapoosa	93	52	74.6	6.15	
Toccoa	88	51	70.6	3.03	
Valdosta	100	62	80.9	4.94	
Valona	97	57	76.6	5.33	
Washington	92	53	75.8	4.26	
Waycross	101	60	79.5	7.52	
Waynesboro	92	57	76.0	3.43	
Westpoint	92	55	74.6	2.39	
Woodbury	96	49	74.4	4.68	
Idaho.					
Albion	85	32	58.2	4.04	T.
American Falls	83	29	56.0	3.40	
Blackfoot	82	31	55.8	1.39	
Bonners Ferry	88	35	57.8	2.24	
Buhl	92	36	60.1	3.18	
Burke	78	31	48.7	3.03	T.
Caldwell	94	35	61.9	1.01	
Cambridge	94	34	61.2	1.67	
Chesterfield	82	29	54.2	2.04	T.
Dent	93	39	61.3	1.97	
Driggs	77	24	49.9	2.72	1.2
Ellerslie	87	34	57.6	1.12	
Emmett	94	36	61.5	1.43	
Forney	88	24	50.6	4.94	
Garnet	91	38	64.9	2.02	
Grace	88	33	57.7	1.77	
Hailey	83	30	55.3	.....	6.0
Hot Springs	92	30	61.8	1.72	
Idaho Falls	84	30	55.1	2.70	
Kellogg	88	37	57.6	1.91	
Lake	74	30	48.1	3.25	5.0
Lakeview	92	38	58.0	1.85	
Landore	78	28	47.9	3.20	2.2
Lardo	82	28	49.9	3.57	2.9
Lost River	75	31	52.0	2.70	.....
Meadows	91	30	54.8	2.79	
Milner	87	32	55.4	3.73	
Moscow	98	36	60.0	2.58	
Mountain Home	89[b]	32[e]	59.4[b]	1.16	
Murray	86	33	56.0	2.42	
Murtaugh	89	32	55.8	3.33	
Nevens Ranch	.....	.....	.....	0.85	0.8
Oakley	82	30	55.6	2.45	
Orofino	94	40	62.3	2.38	
Paris	78	25	50.4	0.92	
Payette	95	39	62.2	1.42	T.
Poplar	.....	.....	.....	1.33	
Porthill	85	39	59.0	1.83	
Rupert	92	34	58.0	2.40	
St. Maries	85	40	59.8	1.25	
Salem	.....	.....	.....	2.73	
Salmon	83	33	55.4	3.12	
Standrod	.....	.....	.....	2.71	1.0
Twin Falls	86	33	57.0	2.43	
Vernon	79	29	54.0	4.29	
Weston	81	29	54.6	1.71	
Illinois.					
Albion	93	49	71.4	4.81	
Aledo	95	45	67.2	2.66	
Alexander	89	44	68.3	2.94	
Antioch	93	42	66.2	4.80	
Ashton	89	41	65.0	4.90	
Astoria	87	42	66.4	3.51	
Aurora	90	54	65.5	3.70	
Beardstown	.....	.....	.....	2.38	
Benton	86	42	67.7	10.72	
Bloomington	94	44	68.0	5.74	
Bushnell	91	45	68.8	3.23	
Cambridge	92	46	68.0	2.55	
Carlinville	90	45	69.2	5.01	
Carlyle	.....	.....	.....	8.27	
Carrollton	93	40	70.2	6.00	
Charleston	91	48	68.2	3.75	
Chester	93	51	73.0	4.74	
Cisne	93	45	71.6	5.74	
Coatsburg	93	43	68.4	4.30	
Cobden	91	48	72.0	2.77	
Colchester	91	46	68.8	2.24	
Decatur	92	43	68.2	4.29	
Dixon	92	43	65.4	3.19	
Dwight	92	41	67.2	2.88	
Equality	90	51	72.4	5.53	
Flora	89	44	69.6	6.08	
Friendgrove	90	48	70.1	4.42	
Galva	92	43	67.3	2.44	
Grafton	.....	.....	.....	5.54	
Greenville	87	48	69.0	6.20	
Griggsville	92	47	70.6	5.00	
Halfway	89	52	71.0	6.65	
Havana	93	49	71.0	3.89	
Henry	89	45	67.6	3.79	
Hillsboro	90	44	69.4	4.88	
Hoopeston	92	43	67.2	5.34	
Joliet	90	45	66.6	1.70	
Kishwaukee	90	43	65.4	4.94	
Lagrange	92	42	65.8	3.99	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Illinois—Cont'd.	°	°	°	*Ins.*	*Ins.*
Laharpe	90	43	68.0	4.45	
Lanark	89	37	64.6	4.48	
Lincoln	92	44	69.3	3.30	
Loami	.....	.....	.....	2.31	
McLeansboro	91	49	70.6	2.89	
Martinsville	97[f]	44[f]	70.0[f]	4.86	
Martinton	93	42	67.0	4.04	
Mascoutah	93	43	71.2	3.33	
Minonk	91	45	66.8	4.19	
Monmouth	93	44	68.7	2.72	
Morrison	88	43	65.6	5.01	
Morrisonville	87	43	67.6	4.37	
Mount Carmel	.....	.....	.....	3.64	
Mount Vernon	92	41	71.1	5.50	
New Burnside	90	49	70.8	5.26	
Olney	91	47	70.4	5.77	
Ottawa	93	47	67.3	2.50	
Palestine	94	45	69.8	4.48	
Pana	86	46	68.2	4.85	
Peoria	.....	.....	.....	3.64	
Philo	91	42	67.0	5.98	
Pontiac	91	46	67.6	3.60	
Rantoul	91	43	67.0	5.45	
Raum	90	50	71.0	4.82	
Riley	90	44	65.6	4.84	
Robinson	88	47	69.2	3.42	
Rockford	91	44	66.8	4.54	
Rushville	89	47	68.8	4.26	
St. Charles	92	44	66.2	4.90	
St. John	91	43	71.4	8.18	
Streator	91	44	65.4	3.55	
Sullivan	91	42	68.6	5.44	
Sycamore	95	42	67.8	4.57	
Tilden	90	44	70.8	4.41	
Tiskilwa	90	44	67.1	3.34	
Tuscola	93	43	68.2	5.22	
Urbana	90	42	66.7	5.56	
Vernon	92	42	70.8	4.95	
Walnut	94	44	68.6	3.44	
Warsaw	.....	.....	.....	8.12	
Windsor	93	42	67.5	4.40	
Winnebago	90[e]	41[e]	65.4[e]	5.81	
Yorkville	95	42	66.8	5.22	
Zion	90	42	66.2	4.80	
Indiana.					
Anderson	88	40	66.7	4.88	
Angola	90	44	65.4	2.98	
Auburn	91	38	64.3	6.23	
Bloomington	89	46	69.8	3.79	
Bluffton	89	39	65.4	6.37	
Butlerville	89	50	68.4	4.94	
Cambridge City	87	46	65.9	5.92	
Columbus	89	49	68.6	5.06	
Connersville	90	45	67.2	4.39	
Delphi	92	42	66.8	5.50	
Elkhart	94	43	67.2	3.06	
Eminence	88	43	67.6	2.00	
Farmersburg	88	45	68.4	6.02	
Farmland	88	40	65.5	6.45	
Fort Wayne	91	40	66.4	5.15	
Franklin	90	42	67.7	4.76	
Greenfield	89	42	68.0	3.48	
Greensburg	91	49	68.8	3.92	
Hammond	91	46	66.4	3.90	
Holland	91	45	71.2	4.14	
Huntington	90	40	67.2	4.47	
Jeffersonville	95	53	72.9	2.20	
Judyville	90	48	68.9	.....	
Knox	88	42	66.2	4.20	
Kokomo	92	40	66.5	4.45	
Lafayette	93	45	67.9	6.36	
Laporte	90	40	64.6	3.78	
Lima	90	41	64.8	4.87	
Logansport	94	44	68.2	6.38	
Madison	95	50	71.4	4.25	
Marengo	91	47	69.8	4.73	
Marion	93	38	67.2	7.46	
Markle	89	38	65.4	7.00	
Mauzy	89	43	66.6	4.41	
Moores Hill	90	45	67.6	2.64	
Mount Vernon	93	49	72.0	3.72	
Northfield	89	37	65.2	3.67	
Paoli	91	46	69.0	6.22	
Plymouth	89	43	65.2	4.40	
Princeton	91	44	70.8	2.28	
Rensselaer	90	42	67.0	3.75	
Richmond	90	45	66.2	7.51	
Rochester	88	42	67.9	6.46	
Rockville	89	46	67.4	3.78	
Rome	94	49	72.4	2.75	
Salamonia	89	37	65.1	4.46	
Salem	91	50	69.1	6.62	
Scottsburg	91	53	71.8	5.14	
Seymour	89	49	67.9	4.30	
Shelbyville	89	42	67.7	6.24	
South Bend	90	45	65.6	4.83	
Syracuse	92	42	66.2	5.69	
Terre Haute	92	49	70.3	7.44	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Indiana—Cont'd.	°	°	°	*Ins.*	*Ins.*
Veedersburg	95[a]	45[d]	67.9[g]	3.02	
Vevay	89	50	69.6	5.20	
Vincennes	93	45	72.1	5.61	
Washington	90	45	67.8	3.57	
Worthington	90	48	69.6	3.42	
Indian Territory.					
Ada	90	52	75.6	4.89	
Ardmore	94	52	76.9	3.45	
Calvin	.....	.....	.....	8.64	
Chickasha	94	49	76.9	5.04	
Durant	93	50	75.8	3.01	
Fairland	92[e]	45[a]	73.6[e]	5.14	
Fort Gibson	.....	.....	.....	3.54	
Hartshorne	93	48	75.6	3.25	
Healdton	93	45	75.2	3.61	
Idabel	96	55	79.2	2.47	
Marlow	92	51	75.7	5.70	
Muskogee	93	48	75.2	3.29	
Okmulgee	93	45	73.4	2.70	
Pauls Valley	94	52	75.3	4.70	
Ravia	93	52	76.4	7.89	
South McAlester	94	50	76.8	2.85	
Tulsa	93	49	74.8	6.82	
Vinita	94[e]	46[e]	73.8[e]	8.96	
Wagoner	98	45	76.6	2.51	
Webbers Falls	96	45	75.6	3.20	
Iowa.					
Afton	93	44	68.9	5.75	
Albia	88	43	66.2	6.27	
Algona	91	43	65.3	5.12	
Allerton	88	44	66.8	4.32	
Alta	91	42	65.4	3.58	
Alton	92	43	65.6	4.56	
Amana	90	42	66.8	7.54	
Ames	90	40	64.9	3.26	
Atlantic	94	36	67.3	5.13	
Audubon	96	38	67.0	3.65	
Baxter	90	44	65.5	5.47	
Bedford	91	40	67.6	4.85	
Belle Plaine	.....	.....	.....	7.16	
Bloomfield	91	41	68.6	5.08	
Bonaparte	87	44	67.6	5.43	
Boone	93	45	65.8	4.93	
Britt	90	43	65.2	4.75	
Buckingham	.....	.....	.....	5.25	
Burlington	89	43	68.0	3.27	
Carroll	92[e]	41	66.4[b]	5.11	
Cedar Rapids	94	45	67.2	6.05	
Chariton	88	43	66.2	4.89	
Clarinda	98	42	68.6	6.01	
Clearlake	90	44	65.8	8.86	
Clinton	92	42	67.6	3.60	
Columbus Junction	89	45	67.8	4.99	
Corning	91	39	67.4	4.61	
Corydon	87	44	67.4	5.29	
Creston	90	41	65.4	4.13	
Cumberland	.....	.....	.....	6.28	
Decorah	92	41	65.6	5.41	
Delaware	88	43	65.2	6.53	
Denison	91	41	65.4	3.35	
Desoto	90	43	66.2	6.54	
Dows	93	40	64.2	5.29	
Earlham	89	41	65.1	6.99	
Elkader	95	40	66.4	5.04	
Elliott	96	41	69.4	3.59	
Elma	.....	.....	.....	3.57	
Estherville	91	42	63.2	6.12	
Fayette	89	39	64.3	6.99	
Forest City	90	43	65.0	8.53	
Fort Dodge	94	44	66.2	4.11	
Fort Madison	.....	.....	.....	4.82	
Galva	90	42	65.8	3.30	
Gilman	.....	.....	.....	4.10	
Grand Meadow	89	43	64.8	5.03	
Greene	92	41	65.1	7.62	
Greenfield	89	43	66.3	7.38	
Grinnell	91	45	67.9	4.91	
Grundy Center	90	42	65.2	6.28	
Guthrie Center	94	41	67.7	5.67	
Hampton	93	43	65.6	5.30	
Hancock	92	45	68.3	3.30	
Harlan	91	40	66.5	3.13	
Humboldt	92	43	66.0	3.41	
Independence	86	41	64.6	7.12	
Indianola	89	46	67.4	5.61	
Inwood	93	38	65.1	4.98	
Iowa City	92	44	68.0	6.04	
Iowa Falls	91	41	65.0	5.89	
Jefferson	93	44	66.6	4.46	
Keosauqua	91	43	68.4	3.75	
Knoxville	91	46	68.0	5.18	
Lacona	.....	.....	.....	6.55	
Larrabee	95	40	67.5	5.27	
Leclaire	.....	.....	.....	3.82	
Lemars	93	42	66.6	4.04	
Lenox	91	44	68.2	7.37	
Leon	92	42	68.1	5.55	
Little Sioux	93	39	68.2	3.61	
Logan	92	42	67.6	4.28	
Maple Valley	.....	.....	.....	5.23	
Marshalltown	90	46	66.6	3.77	
Mason City	92	44	65.9	7.03	
Massena	94	40	67.1	4.76	
Mountayr	73	43	67.8	7.80	
Mount Pleasant	90	47	68.3	5.61	
Mount Vernon	91	44	67.0	4.34	
Murray	93	44	67.8	4.67	
Muscatine	.....	.....	.....	4.21	
New Hampton	87	42	63.6	6.15	
Newton	90	43	67.1	3.69	
Northwood	90	42	63.4	9.33	
Odebolt	95	42	68.6	4.48	
Olin	88	40	66.2	5.23	
Onawa	94	44	69.5	4.52	
Osage	90	38	64.0	6.82	
Oskaloosa	90	39	66.2	6.68	
Ottumwa	93	48	69.0	7.07	
Pacific Junction	92	41	69.0	4.09	
Pella	92	45	69.0	6.24	
Perry	94	44	67.1	8.69	
Plover	93	40	66.5	6.01	
Pocahontas	92	43	66.1	4.31	
Ridgeway	90	42	65.1	5.60	
Rock Rapids	94	40	64.0	6.57	
Rockwell	93	43	66.5	4.11	
Sac City	90	40	65.2	5.45	
St. Charles	91	45	66.6	7.31	
Sheldon	94	40	66.2	6.53	
Sibley	90	39	63.4	5.41	
Sigourney	91	40	67.8	5.93	
Sioux Center	90	40	64.9	3.77	
Stockport	86	45	66.6	3.94	
Storm Lake	94	43	66.6	4.15	
Stuart	94	45	67.3	8.40	
Thurman	93	40	70.0	4.84	
Tipton	92	47	68.8	4.00	
Toledo	91	42	65.6	5.21	
Wapello	87	47	66.8	4.27	
Washington	88[e]	44[d]	65.2[e]	5.48	
Washta	92	40	66.4	3.39	
Waterloo	92	43	66.2	6.41	
Waukee	92	41	67.8	8.35	
Waverly	88	43	64.6	5.89	
Webster City	95	41	67.2	5.04	
Westbend	93	42	66.7	4.97	
Whitten	92	42	65.8	5.28	
Wilton Junction	94	43	67.5	3.88	
Winterset	94	44	69.0	7.06	
Woodburn	90	38	66.2	5.12	
Zearing	91	40	65.4	4.75	
Kansas.					
Abilene	.....	.....	.....	6.02	
Alton	103	44	73.2	4.48	
Anthony	97	47	74.9	5.36	
Ashland	100	48	73.6	5.26	
Atchison	92	45	71.8	4.81	
Baker	91	43	69.6	7.73	
Beloit	.....	.....	.....	4.44	
Blue Rapids	.....	.....	.....	2.82	
Burlington	98	45	73.0	5.39	
Chapman	96	44	73.2	5.34	
Cimarron	98[d]	42[d]	70.2[d]	3.42	
Clay Center	97	43	72.4	4.40	
Colby	99	40	69.8	2.16	
Coldwater	101	48	73.1	3.09	
Columbus	92	45	72.8	6.26	
Coolidge	96	39	68.6	2.57	
Cottonwood Falls	94	43	73.4	5.14	
Cunningham	100	44	73.6	3.50	
Dresden	100	45	70.6	2.82	
Eldorado	97[e]	44[f]	72.6[b]	4.32	
Ellinwood	100	43	72.6	4.89	
Ellsworth	99	41	72.4	3.34	
Emporia	92	48	71.5	5.20	
Enterprise	97	44	73.4	5.53	
Eskridge	90	49	70.6	6.25	
Eureka	.....	.....	.....	4.84	
Fall River	98	46	72.8	5.48	
Farnsworth	101	40	71.0	3.25	
Fort Scott	94	43	71.4	6.97	
Frankfort	97	42	71.8	3.80	
Garden City	102	43	72.4	2.55	
Garnett	97	45	72.2	5.74	
Goodland	100	40	70.7	1.52	
Gove *[1]	98	50	73.4	5.46	
Greensburg	99	45	73.8	3.38	
Grenola	96	48	71.5	9.34	
Hanover	97	44	72.6	4.16	
Harrison	98	39	70.8	4.19	
Hays	99	40	70.4	4.97	
Hill City	101	41	72.8	5.35	
Horton	94	48	71.0	8.94	
Howard	96	48	72.9	12.59	
Hoxie	100	38	71.8	2.99	
Hugoton	98[e]	40[h]	71.1[e]	4.17	
Hutchinson	97	44	72.8	3.52	
Independence	101	48	75.2	5.96	
Jetmore	104	38	71.8	3.22	
Jewell	103	41	72.2	4.21	
La Crosse	.....	.....	.....	5.50	
Lakin	102	42	71.8	0.95	
Larned	100	38	70.8	7.62	
Lebanon	100[i]	55[i]	75.6[i]	2.91	
Lebo	96	48	72.6	4.91	
Liberal	98	44	72.2	6.22	
Macksville	100	43	71.5	3.81	
McPherson	98	45	73.4	4.23	
Madison	94	46	72.2	6.91	
Manhattan	96	42	72.0	6.45	
Manhattan Agr. College	92	45	70.9	5.12	
Minneapolis	94	45	71.7	5.79	
Moran	96	44	72.5	5.94	
Mounthope	.....	.....	.....	2.96	
Neosho Rapids	.....	.....	.....	4.91	
Newton	96	42	72.6	3.07	
Norton	100	42	70.2	5.49	
Norwich	95	50	74.0	4.92	
Oberlin	.....	.....	.....	2.52	
Olathe	.....	.....	.....	6.80	
Osage City	93	45	72.2	9.17	
Oswego	92	47	73.2	6.56	
Ottawa	92	42	71.0	7.18	
Paola	91	44	72.0	7.87	
Phillipsburg	100	45	72.0	6.30	
Pleasanton	99	42	70.4	5.90	
Pratt	99	43	72.8	3.27	
Republic	98	36	71.8	4.15	
Rome	95	44	72.8	5.04	
Russell	99	40	71.0	7.72	
Salina	99	49	73.4	3.27	
Scott	99	40	69.8	4.32	
Sedan	96	48	72.8	7.51	
Toronto	96	43	72.7	4.29	
Ulysses	100[e]	41[f]	70.0[f]	4.02	
Valley Falls	92	44	70.3	3.22	
Wakeeney	100	40	71.2	4.95	
Wakeeney (near)	.....	.....	.....	5.01	
Wallace	100	39	69.9	0.81	
Walnut	94	48	72.8	7.20	
Winfield	96	47	73.8	5.35	
Yates Center	97	48	72.8	6.49	
Kentucky.					
Alpha	87	51	68.6	5.90	
Anchorage	91	48	69.5	2.04	
Bardstown	94	47	71.5	6.01	
Beattyville	91	44	69.2	7.52	
Beaver Dam	92	47	71.0	4.84	
Berea	91	47	69.8	4.78	
Blandville	91	48	73.0	4.16	
Bowling Green	95	49	74.8	2.90	
Burnside	93	46	70.5	8.70	
Cadiz	90	50	72.2	3.79	
Calhoun	93	49	72.8	3.86	
Catlettsburg	93	49	68.4	8.88	
Earlington	93	48	72.2	1.74	
Edmonton	91[e]	45[e]	69.9[e]	4.73	
Eubanks	90	41	67.4	4.09	
Falmouth	.....	.....	.....	6.78	
Farmers	92	42	68.4	7.30	
Frankfort	89	49	69.4	4.63	
Franklin	92	50	72.2	4.36	
Greensburg	93	43	69.7	5.70	
High Bridge	.....	.....	.....	5.30	
Hopkinsville	91	46	70.4	2.94	
Irvington	91	50	71.6	3.77	
Leitchfield	88	48	69.5	2.75	
Loretto	93	45	70.8	5.79	
Lynnville	91	48	72.3	1.62	
Marion	90	53	72.4	4.51	
Maysville	94	47	69.4	6.49	
Middlesboro	92	45	70.0	7.58	
Mount Sterling	91	50	69.7	9.41	
Owensboro	89	51	71.2	5.74	
Owenton	88	50	68.6	3.93	
Paducah	93	55	75.4	3.44	
Richmond	91	49	69.0	4.19	
St. John	91	46	68.6	4.02	
Scott	88	50	67.8	3.67	
Shelby City	90	45	68.2	5.86	
Shelbyville	90[e]	45[e]	68.2[e]	2.70	
Taylorsville	93	46	69.8	4.01	
West Liberty	94	43	69.4	8.17	
Williamsburg	90	44	68.6	7.65	
Williamstown	87	50	67.9	4.73	
Louisiana.					
Abbeville	99	57	81.2	1.44	
Alexandria	102	54	81.2	2.17	
Amite	98	54	78.3	4.72	
Baton Rouge	98	54	78.2	1.50	
Burnside	96	57	78.4	0.33	
Calhoun	95	52	78.0	2.25	
Cameron	94	63	81.3	0.03	
Cheneyville	97	57	78.4	2.22	
Clinton	93	55	77.0	1.83	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
***Louisiana*—Cont'd.**	°	°	°	*Ins.*	*Ins.*
Collinston	94	56	79.7	1.25	
Covington	95	56	79.4	2.79	
Donaldsonville	98	56	80.0	3.27	
Farmerville	93	56	78.8	2.52	
Ferriday	94	55	78.8	1.55	
Franklin	97	58	80.8	1.47	
Grand Cane	97	53	78.3	0.63	
Grand Coteau	97	58	79.8	3.09	
Houma	97	55	78.9	0.84	
Jennings	96	58	79.5	0.78	
Lafayette	96	57	79.2	0.76	
Lake Charles	98	52	78.8	0.10	
Lakeside	95	61	80.6	0.26	
Logansport	.....	.....	.....	0.29	
Lawrence	94	58	79.2	2.32	
Libertyhill	98	52	78.2	1.68	
Melville	99	59	80.0	3.15	
Monroe	95	55	78.4	2.94	
Morgan City	.....	.....	.....	1.64	
New Iberia	.....	.....	.....	0.50	
Opelousas	99	57	80.4	1.75	
Plain Dealing	96	50	78.0	1.69	
Rayne	96	58	81.0	0.74	
Reserve	100	59	81.5	1.74	
Robeline	98	50	78.2	1.47	
St. Francisville	97	56	79.4	0.50	
Schriever	97	55	79.0	3.43	
Simmesport	.....	.....	.....	0.94	
Southern University	.....	.....	.....	5.08	
Sugar Experiment Station	94	60	79.5	2.83	
Sugartown	94	56	79.0	0.30	
Maine.					
Bar Harbor	90	35	57.5	4.48	
Cornish	94	38	63.3	4.25	
Danforth	.....	.....	.....	3.59	
Debsconeag	96	35	63.0	7.57	
Fairfield	94	38	62.6	2.95	
Farmington	94	35	62.0	2.88	
Gardiner	93	35	62.2	3.10	
Houlton	96	32	61.4	4.20	
Lewiston	97	42	63.7	4.79	
Madison	97[e]	38[e]	61.4[e]	3.89	
Mayfield	90	39	60.9	4.64	
Millinocket	101	32	62.8	7.33	
North Bridgton	95	39	62.9	4.28	
Orono	90	34	61.8	5.77	
Patten	96	30	60.9	10.04	
Rumford Falls	96	36	63.2	3.03	
The Forks	.....	.....	.....	4.21	
Van Buren	90	31	62.5	6.20	
Winslow	93	32	63.1	2.90	
Maryland.					
Annapolis	90	48	66.8	7.85	
Bachmans Valley	89	43	64.3	6.66	
Cambridge	96	49	67.8	6.03	
Cheltenham	90	45	66.4	6.31	
Chestertown	88	46	65.7	4.76	
Chewsville	88	39	63.6	4.16	
Clearspring	87	44	63.6	6.01	
Coleman	89	47	66.2	6.42	
Collegepark (Md. Ex. Sta.)	92	40	64.8	5.58	
Cumberland	91	46	66.0	8.40	
Darlington	90	45	64.8	5.75	
Deerpark	84[e]	32[e]	58.0[e]	4.89	
Denton	92	44	65.8	6.26	
Easton	89	48	65.2	6.27	
Fallston	88	45	63.8	6.56	
Frederick	90	46	65.6	5.97	
Frostburg	.....	.....	.....	6.97	
Grantsville	85	39	59.0	3.46	
Great Falls	93	41	65.7	4.28	
Greenspring Furnace	90	41	64.9	5.36	
Harney	.....	.....	.....	6.81	
Jewell	89	45	65.1	6.73	
Keedysville	93	41	65.6	5.27	
Lake Montebello	91	45	65.1	5.62	
Laurel	96	42	65.0	5.30	
Monrovia	89	45	64.6	5.61	
Mount St. Marys College	88	44	65.2	7.84	
Oakland	85	32	58.4	5.20	
Pocomoke City	90	48	66.2	4.66	
Portobello	92	40	66.8	5.02	
Princess Anne	89	46	64.9	3.76	
Salisbury	92	45	66.4	3.49	
Solomons	88	48	66.8	3.55	
Sudlersville	90	44	65.2	5.79	
Takoma Park	87	46	64.0	5.95	
Taneytown	87	39	63.2	6.67	
Van Bibber	88	46	64.4	6.33	
Western Port	91	40	63.8	6.53	
Woodstock	90	44	66.0	.....	
Massachusetts.					
Amherst	95	38	63.7	2.61	
Bedford	89	38	62.4	2.45	
Bluehill (summit)	91	41	62.4	3.18	
Chestnut Hill	94	38	64.7	3.39	
Concord	92	36	62.0	2.81	
Fall River	86	45	63.0	2.07	
***Massachusetts*—Cont'd.**	°	°	°	*Ins.*	*Ins.*
Fitchburg	93	41	64.2	3.51	
Framingham	94	35	62.4	3.20	
Groton	91	38	62.4	3.82	
Hyannis	83	42	60.0	1.68	
Jefferson	.....	.....	.....	3.49	
Lawrence	94	39	63.9	2.26	
Leominster	.....	.....	.....	4.87	
Lowell	91	40	65.6	3.03	
Middleboro	88	33	61.2	2.26	
Monson	89	36	63.0	2.38	
Plymouth	89	40	61.4	2.36	
Provincetown	84	44	62.6	1.75	
Somerset	94	42	66.1	1.95	
Sterling	.....	.....	.....	3.49	
Taunton	88	33	60.8	2.40	
Webster	.....	.....	.....	3.71	
Westboro	94	36	65.4	3.80	
Weston	.....	.....	.....	2.52	
Williamstown	87	38	62.0	3.86	
Winchendon	.....	.....	.....	2.78	
Worcester	93	42	64.8	2.73	
Michigan.					
Adrian	90	40	65.2	5.39	
Agricultural College	90	41	65.0	2.37	
Allegan	90[f]	30[f]	63.2[f]	3.00	
Alma	91	38	64.4	3.41	
Ann Arbor	91	41	64.0	1.94	
Arbela	92	38	65.0	1.79	
Ball Mountain	87	40	62.3	3.08	
Baraga	92	30	59.7	1.00	
Battle Creek	89	40	65.2	2.55	
Bay City	95	40	66.0	1.90	
Berlin	95	38	63.1	3.19	
Big Rapids	91	35	64.0	3.36	
Blaney	87	30	59.4	2.14	
Bloomingdale	91	40	65.8	2.25	
Calumet	90	40	61.6	1.50	
Cassopolis	87	45	65.0	4.90	
Charlevoix	90	38	64.6	1.14	
Charlotte	87	36	61.4	2.30	
Chatham	90	30	59.0	0.61	
Cheboygan	93	35	62.8	2.69	
Clinton	88	40	64.5	2.52	
Coldwater	89	37	64.9	3.97	
Concord	89	32	64.0	2.83	
Deer Park	91	37	58.5	0.40	
Detour	86	41	59.2	2.40	
Durand	93	40	66.6	2.27	
Eagle Harbor	87	35	55.6	1.32	
East Tawas	85[e]	39[e]	61.6[e]	3.97	
Eloise	91	40	65.0	2.62	
Ewen	95	30	60.6	0.00	
Flint	90	40	63.8	1.41	
Frankfort	80	42	60.9	1.70	
Gaylord	.....	.....	.....	0.57	
Grand Marais	80	37	56.9	0.72	
Grape	89	41	64.6	3.40	
Grasslake	90	38	64.4	3.59	
Grayling	.....	.....	.....	1.00	
Harbert	.....	.....	.....	3.15	
Harbor Beach	.....	.....	.....	2.50	
Harrison	95	37	63.6	0.50	
Harrisville	100	39	59.6	2.80	
Hayes	91	38	63.6	2.67	
Highland	.....	.....	.....	3.57	
Hillsdale	89	42	64.0	2.62	
Holland	87	43	64.8	2.89	
Howell	88	40	64.2	4.59	
Humboldt	86[e]	28[e]	59.6[e]	1.00	
Iron Mountain	93	40	64.8	1.29	
Iron River	90	30	61.0	2.47	
Ironwood	91	33	64.0	0.56	
Ishpeming	84	34	59.0	1.65	
Isle Royal	70	33	47.3	0.93	
Ivan	97	34	65.4	3.63	
Jackson	95	41	66.4	2.42	
Jeddo	90	41	64.6	3.31	
Kalamazoo	90	44	65.2	2.74	
Kenton	92[e]	33[e]	60.4[e]	0.82	
Lansing	90	41	65.5	2.52	
Lapeer	93	39	65.3	2.55	
Ludington	84[e]	40[e]	62.0[e]	1.94	
Mackinac Island	80	30	57.6	4.15	
Mackinaw	89	39	60.6	2.00	
Mancelona	97	34	64.0	2.03	
Manistee	88	41	61.2	.....	
Maple Ridge	92	32	61.5	1.45	
Menominee	92	42	62.4	2.11	
Montague	.....	.....	.....	2.72	
Morenci	87	42	64.7	3.89	
Mount Clemens	86	40	63.3	3.60	
Mount Pleasant	.....	.....	.....	2.81	
Muskegon	86	42	63.9	2.46	
Old Mission	92	40	62.6	2.19	
Olivet	88	41	64.6	2.95	
Omer	92	33	63.2	2.48	
Onaway	92	32	63.1	.....	
Ovid	92	38	65.3	3.61	
***Michigan*—Cont'd.**	°	°	°	*Ins.*	*Ins.*
Owosso	91	38	65.3	2.57	
Petoskey	88	38	61.6	4.87	
Port Austin	92	39	62.9	0.40	
Powers	95	34	62.8	.....	
Reed City	.....	.....	.....	1.30	
Roscommon	99	33	63.4	3.52	
Saginaw (W. S.)	93	40	66.2	1.66	
St. Ignace	85	35	59.8	1.46	
St. James	81	40	59.2	2.16	
St. Johns	91	39	64.8	2.09	
St. Joseph	88	45	64.7	4.41	
Saranac	95	38	66.2	2.36	
South Haven	.....	.....	.....	2.49	
Stanton	.....	.....	.....	5.32	
Thomaston	96	30	61.4	1.15	
Thornville	89	41	65.0	4.08	
Traverse City	98	39	64.2	2.01	
Vassar	.....	.....	.....	1.60	
Wasepi	88	40	64.5	5.99	
Webberville	89	40	64.9	2.90	
Wetmore	90	25	61.1	0.30	
Whitefish Point	80	35	52.8	1.47	
Woodlawn	91	34	61.0	2.54	
Ypsilanti	89	41	63.0	3.53	
Minnesota.					
Albert Lea	.....	.....	.....	7.82	
Alexandria	84	39	62.2	3.08	
Angus	87	29	62.0	4.46	
Bagley	89	31	61.4	4.79	
Beardsley	86	38	63.6	5.60	
Beaulieu	86	32	62.6	4.51	
Bird Island	90	41	65.1	3.84	
Blackduck	90	32	62.0	2.94	
Caledonia	88	45	64.7	4.21	
Campbell	90	34	62.6	4.28	
Collegeville	90	40	64.3	4.20	
Crookston	90	35	63.8	5.14	
Detroit	87	33	61.8	3.50	
Fairmount	87	43	64.8	9.16	
Faribault	88	41	63.2	5.65	
Farmington	88	42	63.6	4.54	
Fergus Falls	87	34	63.8	3.71	
Floodwood	93	32	62.4	3.05	
Fort Ripley	87	35	65.6	3.67	
Grand Meadow	89	40	62.9	5.01	
Hallock	91	28	63.0	2.72	
Halstad	87	32	62.1	4.59	
Hinckley	90	37	62.7	1.92	
Hovland	80	30	54.2	0.75	
Lake Crystal	88[d]	44[d]	64.6[d]	4.93	
Leech Lake	89	34	61.4	6.21	
Little Falls	91	40	64.2	4.01	
Long Prairie	89	38	66.1	5.12	
Luverne	90	39	64.0	6.31	
Lynd	90	40	63.2	5.08	
Mankato	.....	.....	.....	6.25	
Maple Plain	90	42	65.6	5.01	
Milan	88	37	63.0	4.72	
Minneapolis	92	41	65.3	3.82	
Montevideo	90	40	65.4	5.79	
Mora	89	34	62.3	3.58	
Morris	90	39	64.2	3.84	
Mount Iron	94	35	61.1	2.35	
New London	90	40	62.9	4.73	
New Richland	91	41	64.8	5.11	
New Ulm	92	44	66.3	5.02	
Osakis	86	41	63.3	3.63	
Park Rapids	90	36	63.2	3.83	
Pine River	91	35	62.4	3.03	
Pipestone	85	37	64.8	4.83	
Pokegama Falls	90	31	61.1	2.81	
Poplar	88	34	60.8	2.96	
Red Wing	.....	.....	.....	4.68	
Redwood Falls	91	42	65.3	6.36	
Reeds	.....	.....	.....	3.04	
St. Charles	89	39	63.8	4.13	
St. Cloud	91	39	64.6	5.05	
St. Peter	88	42	62.6	5.17	
Sandy Lake Dam	90	39	63.4	1.55	
Shakopee	89	42	65.0	5.96	
Stephens Mines	95	30	60.8	.....	
Tonka Bay	.....	.....	.....	4.86	
Two Harbors	85	32	56.7	1.02	
Wabasha	95	41	66.6	4.58	
Wadena	89	34	63.3	3.88	
Willow River	91	32	60.0	1.68	
Windom	90	41	65.0	.....	
Winnebago	91	43	66.0	5.87	
Winnebegoshish	90	41	63.4	3.58	
Winona	89	44	64.9	2.66	
Worthington	89	40	63.4	5.01	
Zumbrota	90	37	64.0	4.05	
Mississippi.					
Aberdeen	93	51	75.4	1.58	
Agricultural College	95	52	75.8	2.15	
Austin	93	54	76.0	1.78	
Batesville	94	53	76.4	3.09	
Bay St. Louis	92	53	78.4	0.28	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
***Mississippi*—Cont'd.**	°	°	°	*Ins.*	*Ins.*
Bellefontaine	91	54	75.4	3.70	
Biloxi	94	58	80.8	1.98	
Booneville	89	50	73.8	2.26	
Brookhaven	97	52	77.8	2.85	
Canton	95	53	76.6	1.19	
Clarksdale	95	53	76.1	2.05	
Columbia				2.00	
Columbus	93	52	75.8	2.22	
Corinth	91	48	73.2	1.54	
Crystal Springs	95	53	76.8	0.78	
Duck Hill	94	50	75.1	4.04	
Edwards	95	53	77.1	3.03	
Enterprise				1.06	
Fayette	90	53	75.8	2.25	
Fayette (near)				1.99	
Greenville	93	54	77.0	1.58	
Greenwood	96	53	76.4	2.22	
Hattiesburg	97	54	78.2	4.34	
Hazlehurst	98	54	77.4	1.73	
Hernando	92	52	75.3	3.94	
Holly Springs	93	51	75.2	2.09	
Indianola	94	53	77.0	2.80	
Jackson	95	53	77.2	2.38	
Kosciusko	93	51	75.3	2.79	
Lake	98	52	75.8	2.69	
Lake Como	96	52	77.4	1.18	
Laurel	96	53	78.2	2.46	
Leakesville	94	58	77.8	4.42	
Louisville	90	50	74.8	3.15	
McNeill	95	54	78.8	2.71	
Macon	94	52	76.2	1.10	
Magnolia	98	52	78.2	1.85	
Monticello	97	51	77.8	0.90	
Natchez	99	54	79.3	1.78	
Okolona	93	53	75.2	3.11	
Pearlington	94	56	78.2	0.74	
Pecan	93	58	77.6	2.33	
Pittsboro	95	50	75.0	2.03	
Pontotoc	88	51	73.0	2.52	
Porterville	95	53	75.7	2.69	
Port Gibson	96	51	77.0	1.05	
Quitman				3.31	
Ripley	93	45	73.4	0.80	
Shoccoe				1.76	
Shubuta				3.16	
Suffolk	96	52	77.0	2.23	
Swan Lake				1.65	
Tchula	94	55	76.8	1.39	
Tupelo	92	49	75.0	3.45	
University	92	52	73.9	2.69	
Utica	94	55	76.8	3.00	
Walnutgrove	90[1]	54[2]	75.0[3]	4.76	
Watervalley	94	50	74.8	3.13	
Waynesboro	96	55	77.4	1.50	
Woodville	96	56	78.8	0.75	
Yazoo City	94	54	76.8	2.66	
Missouri.					
Albany				5.41	
Appleton City	92	50	72.2	8.87	
Arlington				7.35	
Arthur	93	46	71.5	6.21	
Avalon	90	47	70.2	8.06	
Belle	89	44	69.7	5.37	
Bethany	90	44	69.4	5.25	
Birchtree	88	50	70.6	4.38	
Bolivar	90	45	70.9	5.78	
Boonville				5.63	
Brunswick	92	49	70.6	8.20	
Cape Girardeau				5.58	
Caruthersville	97	47	75.2	0.94	
Clinton	92	30	72.8	7.49	
Conception	84	48	66.5	4.60	
Darksville[4]	90	54	71.1	7.00	
Dean	92	43	71.6	6.48	
Decaturville	91[5]	42[5]	70.6[5]	4.17	
De Soto	89	46	70.3	4.62	
Doniphan	91	47	72.4	1.11	
Fairport				3.46	
Farmington	87	46	70.0	2.81	
Fayette	88	48	69.0	6.79	
Fulton	89	47	70.2	3.48	
Gads Hill	94	46	71.5	2.43	
Gallatin				6.85	
Gano	92	47	70.8	3.18	
Goodland	88	42	68.3	3.24	
Gorin				5.76	
Grant City	90	45	68.6	6.69	
Harrisonville	91	48	71.4	4.07	
Hazlehurst				7.63	
Hermann				5.75	
Houston	90	44	69.4	6.03	
Huntsville				9.40	
Ironton	90	43	69.8	3.91	
Jackson	91	45	73.4	4.18	
Jefferson City	91	47	70.0	5.88	
Kidder	89	45	69.8	7.65	
Koshkonong	90	48	70.2	4.90	
Lamar	92	45	72.6	7.18	

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
***Missouri*—Cont'd.**	°	°	°	*Ins.*	*Ins.*
Lamonte				7.58	
Lebanon	99	45	70.6	4.44	
Lexington	89	48	70.6	9.32	
Liberty	88	42	70.2	6.81	
Lockwood	90	48	72.7	6.63	
Louisiana	90	42	69.0	4.03	
Marblehill	91[c]	45[c]	70.9[c]	4.99	
Marshall	91	48	70.8	7.98	
Maryville	93	44	69.4	7.12	
Mexico	91	43	69.4	4.11	
Monroe	90	46	68.4	3.60	
Mountain Grove	88	45	69.0	4.70	
Mount Vernon	92	43	70.0	4.71	
Neosho	91	40	71.8	6.33	
Nevada				7.33	
New Madrid				4.41	
New Palestine	91	45	71.0	4.60	
Oakfield	90	48	70.5	7.22	
Olden	91	47	70.5	5.32	
Oregon	92	94	69.4	4.44	
Osceola				6.29	
Rolla	90	47	70.2	5.32	
St. Charles	90	46	70.5	5.61	
St. Joseph				3.70	
Sikeston	90	46	72.6	4.01	
Steffenville	88	45	69.8	6.38	
Sublett	90	45	68.5	4.05	
Trenton	91	48	70.2	6.27	
Unionville	90	44	67.8	8.69	
Versailles	89	45	71.2	5.04	
Warrensburg	92	48	71.8	10.35	
Warrenton	92	48	70.2	5.58	
Warsaw	92	42	71.4	6.93	
Wheatland				7.37	
Willowsprings	90	40	69.8	2.46	
Montana.					
Adel	78	30	51.8	5.13	
Anaconda	78	31	51.6	4.12	
Augusta	83	33	54.0	6.35	
Babb	77	30	50.3	7.11	
Billings	88[1]	43[1]	61.9[1]	1.17	
Boulder	80	32	52.8	2.65	
Bowen	86	28	48.3	3.08	
Broadview	81	32	58.2	4.32	
Busby	80	35	60.0	2.33	
Canyon Ferry	81	34	57.2	4.01	
Cascade	83	38	58.7	7.81	
Chester	82	33	57.4	6.36	
Chinook	87	35	60.4	4.51	
Choteau	85	35	56.8	8.10	
Columbia Falls	84	29	55.0	3.28	
Crow Agency	85	39	60.8	3.70	
Dayton	81	35	54.6	2.58	
Decker	90	33	59.8	2.45	
Dillon	81	34	56.2	5.67	
Ekalaka	88	33	61.0	3.21	
Ericson				5.59	
Fallon	88	35	62.9	3.10	
Forsyth	88[b]	37	61.8[d]	3.53	
Fort Benton				6.15	
Fort Logan	80	28	48.1	3.10	
Fort Shaw	83[e]	41[e]	61.8[e]	5.09	
Fortine	85	25	54.5	3.10	
Glasgow	89	31	62.2	3.35	
Glendive	88	34	64.8	3.93	
Gold Butte	77	24	49.0	7.81	
Graham	88	35	60.8	3.27	
Grayling	69	25	46.1	2.18	
Greatfalls	79	39	58.6	7.46	
Highwood				8.00	
Home Park				4.58	
Huntley	85	40	59.9	1.76	
Jordan	82	35	60.0	3.75	
Lewistown	80	36	56.2	3.90	
Livingston	86	33	57.3	1.62	
Lodge Grass	85[c]	35[c]	59.0[c]	1.42	
Malta	84	32	60.4	2.91	
Marysville	74	30	51.8	4.33	3.0
Missoula	89	37	59.6	4.41	
Moore				6.35	
Norris	78[c]	35[c]	55.2[c]	2.85	
Nye				1.93	
Ovando	82	34	58.3	3.18	
Philipsburg	85	30	52.1	4.81	T.
Plains	84	37	56.1	2.00	
Polson	85	37	57.0	2.72	
Poplar	87	33	62.0	4.71	
Raymond				5.91	
Red Lodge	77	30	52.7	3.31	
Renovo	79	33	54.2	3.91	
Saltese				1.90	
Snowshoe	79	34	51.2	5.98	
Springbrook	85	32	61.4	6.24	
Steele	80	40	59.1	6.63	
Tokna	87	32	63.8	3.15	
Townsend				4.07	
Tosten	82	33	56.4	2.86	
Utica	76	33	54.7	6.75	

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
***Montana*—Cont'd.**	°	°	°	*Ins.*	*Ins.*
Valentine	84	35	60.4	2.71	
Wolf Creek	82	23	54.6	3.75	
Nebraska					
Agate	88	32	60.3	3.25	
Ainsworth	92	38	66.2	4.25	
Alliance	92	42	64.8	3.00	
Alma	96	44	70.2	4.18	
Anoka				4.58	
Arapahoe				5.43	
Arcadia				4.13	
Ashland	92	43	69.4	6.96	
Ashton				2.70	
Atkinson				5.47	
Auburn	95	41	68.3	3.56	
Beatrice	94	43	70.4	5.00	
Beaver	96	46	76.2	3.35	
Bellevue	91	42	69.0	6.37	
Benkleman				2.60	
Blair	93	45	68.0	5.81	
Blue Hill				6.40	
Blue Springs				5.01	
Bradshaw				6.53	
Bridgeport	91	33	63.1	3.17	
Brokenbow	93	41	66.4	4.91	
Burchard				4.66	
Burwell				4.35	
Callaway	91	41	66.6	4.70	
Central City				4.38	
Chester				4.10	
Columbus	94	39	67.8	3.47	
Crete	93	43	70.2	5.78	
Culbertson	99	38	69.8	3.22	
David City	90	40	67.6	4.48	
Dawson	96	44	71.3	4.48	
Dubois				3.96	
Duff				4.45	
Dunning				3.25	
Edgar				5.44	
Ellis				5.83	
Ericson				2.38	
Ewing	90	36	64.2	5.54	
Fairbury	95	43	71.1	5.99	
Fairmount	97	41	69.0	3.83	
Fort Robinson	87	41	61.6	4.00	
Franklin	103	44	71.6	5.58	
Fremont	93	42	68.2	6.94	
Fullerton	94	39	68.7	4.97	
Geneva	95	45	70.0	4.70	
Genoa (near)	92	38	68.2	3.91	
Gosper				3.52	
Gothenburg	97	42	67.9	4.79	
Grand Island	95	47	70.7	4.44	
Grant	97[c]	33[d]	64.2[d]	2.59	
Greeley				1.63	
Guide Rock				5.17	
Halsey	96	42	67.0	3.84	
Hartington	95	38	67.4	5.75	
Harvard	92	40	67.9	4.94	
Hastings	94	44	69.6	5.39	
Hayes Center	101[c]	41[c]	66.4[c]	4.25	
Hay Springs	90	30	61.4	3.29	
Hebron	95	42	70.3	4.75	
Holdrege	95	47	70.8	7.68	
Hooper[a]	95	50	68.8	5.65	
Imperial	98	37	65.9	2.05	
Kennedy	100	35	67.0	2.25	
Kimball	94	40	64.2	1.68	T.
Kirkwood	93	34	64.6	5.43	
Leavitt	96	38	69.1	5.76	
Lexington	95	42	67.0	3.77	
Lodgepole[f]	84	32	60.8		
Loup	94	40	66.6	2.89	
Lynch	96	34	67.4	5.65	
McCook				5.01	
McCool				4.57	
Madison	91	40	67.4	2.51	
Marquette				4.41	
Mason				2.63	
Minden	97	45	69.2	4.55	
Monroe				4.55	
Nebraska City	93	42	69.2	5.07	
Nemaha				4.43	
Norfolk	94	38	67.7	3.86	
North Loup	95	41	67.9	2.65	
Oakdale	94	39	67.0	3.44	
Odell				4.45	
Ord				4.12	
Osceola	100	41	72.1	3.97	
Palmer				2.80	
Palmyra[a1]	94	52	70.2	7.20	
Pawnee City	95	41	70.0	3.30	
Plattsmouth				5.12	
Plymouth	93	45	70.2	5.32	
Purdum	99	41	68.8	4.57	
Ravenna	95	41	68.6	2.51	
Redcloud	100	38	71.0	5.04	
Republican				3.71	
Rulo				5.80	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Nebraska—Cont'd.	°	°	°	*Ins.*	*Ins.*
St. Libory				4.74	
St. Paul	95	42	69.3	5.08	
Santee	94	38	67.8	6.32	
Schuyler				4.20	
Scottsbluff	92	33	62.6	2.62	
Seward	93	40	69.0	4.35	
Springview	95	34	65.3	2.85	
Stanton	95	40	67.9	3.38	
Strang				5.87	
Stratton				1.65	
Superior	99	42	70.5	3.84	
Syracuse				5.35	
Tablerock				4.92	
Tecumseh	94	41	70.8	3.75	
Tekamah	93	44	69.6	4.79	
Turlington	95	44	68.7	5.11	
University Farm	92	43	69.4	6.59	
Wahoo				5.31	
Wakefield	94	39	66.4	3.87	
Watertown				2.61	
Wauneta				2.64	
Weeping Water	95	39	68.8	4.52	
Westpoint	92	38	67.5	5.88	
Wilber				7.33	
Wilsonville				2.65	
Winnebago	91	38	65.6	3.63	
Wisner				4.69	
Wymore				2.18	
York	95	42	69.3	4.04	
Nevada.					
Amos	88	31	57.6	0.66	
Battle Mountain	88	26	56.3	T.	T.
Beowawe				0.12	1.2
Carlin	85	35	55.4	0.85	T.
Carson City	97	35	63.0	0.99	
Clover Valley	83	28	52.8	2.07	T.
Columbia	89	28	60.7	0.83	T.
Elko [1]	86	32	57.0	1.17	
Eureka	85	21	53.6	3.86	11.0
Fallon	93	33	62.0	0.66	
Fenelon [1]	80	26	51.6		
Fernley	99	30	61.6	1.03	
Gardnerville	82	28°	55.7°	0.50	
Geyser	85	25	52.0	1.54	T.
Golconda	91	33	59.7	1.25	T.
Halleck [1]	80	32	55.5	2.00	T.
Hamilton	75	18	47.4	3.07	18.0
Humboldt [1]	82	34	50.1	0.00	
Leetville	93	36	62.8	0.08	
Lewers Ranch	84	29	55.6	2.35	T.
Logan	111	44	75.6	0.00	
McAfees Ranch	92	19	52.4	T.	T.
McGill	48	25	54.6	1.78	4.8
Mill City [1]	90	36	60.2	0.01	
Mina	92	32	57.5	0.00	
Palmetto	86	18	53.2	2.42	4.0
Paradise Valley				1.61	
Potts	88	25	54.0	2.10	8.0
San Jacinto	84	31	53.8	2.92	1.0
Squaw Valley	92	27	57.8	2.04	1.0
Tecoma	89	30	55.2	0.98	
Wabuska	89	31	58.2	0.38	T.
New Hampshire.					
Alstead	90	39	61.6	3.49	
Bethlehem	90	35	60.6	3.94	
Brookline	96	38	64.5	2.94	
Durham	94	34	61.9	2.62	
Franklin Falls	97	36	63.8	3.31	
Grafton	91	33	60.6	2.92	
Hanover	96	37	63.6	3.88	
Keene	96	34	62.5	2.82	
Nashua	96	36	65.3	2.40	
Newton	94	33	60.8	3.84	
Plymouth	97	35	63.0	3.24	
New Jersey.					
Asbury Park	85	46	62.2	5.28	T.
Bayonne	92	44	64.9	3.70	
Belvidere	93	40	65.2	3.99	
Bergen Point	90	45	65.4	3.95	
Beverly	93	41	65.7	5.20	
Bridgeton	95	43	66.9	4.86	
Canton				5.43	
Cape May C. H.	88	44	65.0	4.87	
Charlotteburg	88	31	61.4	5.68	
Clayton	90	42	64.6	6.00	
College Farm	90	39	64.2	3.44	
Culvers Lake				5.02	
Dover	90	37	63.0	4.09	
Elizabeth	96	46	67.0	3.82	
Englewood	89	43	65.2	3.52	
Flemington	91	39	64.8	4.16	
Friesburg	89	40	64.5	5.09	
Hightstown	89	39	64.2	4.44	
Imlaystown	94	45	65.6	5.22	
Indian Mills	94	37	65.2	4.73	
Jersey City	89	46	66.5	3.15	
Lambertville	91	40	65.6	5.21	
Layton	89	33	62.3	4.14	T.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
New Jersey—Cont'd.	°	°	°	*Ins.*	*Ins.*
Moorestown	91	41	64.8	6.85	
Newark	92	44	65.5	4.37	
New Brunswick	91	38	64.4	3.70	T.
Newton	90	36	63.1	4.77	
Oceanic	90	44	64.6	3.81	
Paterson	94	43	66.5	3.36	
Phillipsburg	92	40	65.6	3.83	
Plainfield	92	44	64.8	3.31	
Pleasantville				3.81	
Rancocas				6.64	
Rivervale	92	34	61.6	3.53	
Somerville	93	38	65.1	3.57	
South Orange	94	41	64.6	3.67	
Sussex	88	37	63.8	4.07	
Trenton	90	41	65.8	5.26	
Tuckerton	87	40	63.6	4.27	
Vineland	92	41	65.2	5.33	
Woodbine	91	42	64.8	5.53	
New Mexico.					
Alamagordo	104	41	75.0	0.78	
Albert	103	45	70.8	1.50	
Albuquerque	97	37	65.6	0.18	
Alto				2.04	
Bellranch	103	42	69.6	2.59	
Bloomfield	98	36	64.4	0.80	
Cambray				1.15	
Carlsbad	110	45	78.1	1.46	
Chama	83	30	53.6	1.03	
Cimarron	89	38	61.2	0.75	
Cliff	100	39	67.8	0.48	
Cloudcroft	82	32	54.7	1.80	
Deming	100	40	58.7	0.35	
Dorsey	92	36	62.8	2.15	
Dulce	88	33	57.3	1.08	
Eagle Rock Ranch	86	36	59.2	1.20	
Elizabethtown	81	28	52.0	0.05	
Elk	98	38	66.8	1.61	
Espanola	93	39	62.7	0.79	
Estancia	90	31	59.2	0.90	
Fort Bayard	97	42	67.5	0.88	
Fort Stanton	94	36	64.4	3.35	
Fort Union	89	32	58.8	1.32	
Fort Wingate	88	39	60.8	2.45	
Frisco				0.40	
Fruitland	94	38	66.3	0.52	
Gage	103	46	72.9	0.98	
Glen	104	47	71.2	3.20	
Hillsboro	99	42	70.6	0.91	
Laguna	94†	40°	65.2°	1.70	
Lagunita	94°	44°	66.9°	2.06	
Lake Valley				0.81	
Las Vegas	95	35	63.3	0.77	
Logan	102	42	69.6	3.07	
Lordsburg	103	44	73.5	T.	
Los Alamos				0.87	
Los Lunas	98	42	68.4	1.07	
Magdalena	92	38	63.4	0.79	
Manuelito				0.55	
Mesilla Park	106	46	74.8	0.58	
Mineral Hill				0.99	
Monument	106	49	76.7	1.20	
Mountain Air	92	39	64.2	0.12	
Nara Visa	99	44	70.6	2.87	
Orange	104	43	73.5	1.23	
Red River				0.73	
Redrock				1.10	
Rincon	103	44	73.0	0.24	
Rociada	83	31	55.0	1.05	
Rosa				0.33	
Rosedale	89	40	64.0	1.74	
San Jon	100	43	72.8	4.54	
San Marcial	103	45	72.7	0.50	
San Rafael	95	32	63.4	1.44	
Socorro	105	40	70.8	0.55	
Springer	95	31	64.5	0.90	
Strauss				0.55	
Taos	90	35	62.0	0.47	
Tres Piedras	83	31	55.0	0.50	
Tucumcari	104	47	72.0	3.36	
Valley				T.	
Vermejo	86	32	56.6	0.13	
New York.					
Adams	95	38	65.0	4.15	
Addison	94	38	62.8	3.94	
Allegany	90	35	61.0	4.76	
Amsterdam	93	38	63.6	2.26	
Angelica	90	33	59.6	3.33	
Appleton	90	40	63.1	2.14	
Athens	90	42	64.8	3.51	
Atlanta	89	30	58.7		
Auburn	90	40	63.0	3.13	
Avon	90	39	62.8	2.44	
Ballston Lake	95	37	63.1	3.06	
Bedford	90	38	63.8	5.04	
Blue Mountain Lake				3.60	T.
Bolivar	90	33	59.8	4.60	
Bouckville	89	37	61.0	2.79	
Brockport	92	41	65.0	1.70	

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
New York—Cont'd.	°	°	°	*Ins.*	*Ins.*
Cape Vincent	89	40	61.3	1.25	
Carmel	90	40	64.6	4.84	
Carvers Falls	92	37	63.6	3.61	
Chatham	93	40	65.2	3.77	
Cooperstown	88	39	62.1	3.92	
Cortland	88	35	60.7	1.48	
Cutchogue	85	42	62.5	2.51	
Dannemora	91	40	63.4	2.72	
De Ruyter	90	34	60.1	3.64	
Easton				3.15	
Elba	87	36	60.9	2.11	
Elmira	91	40	63.9	3.78	
Faust	91	30	60.4	2.22	
Fayetteville	94	40	65.4	4.89	
Fort Plain	93	41	66.2	2.22	
Franklinville	88	31	59.2	5.24	
Gabriels	94	27	59.4	3.02	
Gansevoort				3.50	
Glens Falls	95	38	64.6	2.70	
Gloversville	93	36	63.1	1.66	
Greenfield	93	36	63.6	3.81	
Greenwich	91	40	63.6	4.22	
Griffin Corners	90	29	57.2	2.55	
Harkness	96	37	65.2	4.65	
Haskinville				4.05	
Hemlock	88	38	62.4	3.01	
Hunt	92	37	63.6	3.20	
Indian Lake	98	28	60.8	2.80	
Ithaca	93	41	62.9	5.15	
Jamestown	88	37	62.6	4.53	
Jeffersonville	91	34	60.8	2.35	
Keene Valley	97	30	62.1	3.68	
Kings Ferry				3.58	
Lake George	91	38	64.2	1.97	
Lake Mohonk	83	38	62.2	4.15	
Le Roy	88	40	63.2	3.58	
Liberty	90	37	61.3	2.84	
Littlefalls, City Res.	88	42	62.8	3.09	
Lockport	86	41	63.2	3.69	
Lowville	92	36	62.0	2.23	
Lyndonville				1.68	
Lyons	94	45	66.8	3.36	
Middletown	88	42	64.6	3.75	
Moira	90	39	64.9	2.36	
Mount Hope	92	38	63.3	4.61	
Newark Valley				3.50	
New Lisbon	88	33	58.4	2.69	
North Hammond	92°	42°	64.5°	2.41	
North Lake	88	30	59.3	3.20	
Norwich	90	39	62.8	2.31	
Ogdensburg	89	43	64.8	1.73	
Oneonta	93	40	63.2	3.01	
Otto	87	40	62.6	5.51	
Oxford	89	34	61.1	2.09	
Oyster Bay	89	43	66.8	5.20	
Palermo				0.84	
Penn Yan	92	37	62.8	3.10	
Philadelphia	93	40	64.2	3.04	
Plattsburg	86	39	64.5	3.45	
Port Jervis	92	38	64.4	2.99	
Richland	92°	42°	66.8°	3.97	
Rose	90	40	63.0	2.98	
Salisbury	90	33	63.5	3.88	
Salisbury Mills	91	39	63.7	4.51	
Saranac Lake	91	29	60.3	3.40	
Scarsdale	88	40	63.1	1.86	
Setauket	87	40	63.0	2.77	
Shortsville	89	41	63.2	2.49	
Skaneateles				4.27	
Southampton	82	40	61.1	2.59	
South Canisteo	90	35	59.4	3.95	
Spier Falls	93	40	63.8	3.39	
Taberg	93	38	63.6	3.51	
Ticonderoga	90	42	65.0	2.39	
Volusia	88	39	60.6	3.64	
Wading River	89	35	62.8	3.51	
Wappinger Falls	90	42	64.4	5.85	
Warwick				3.68	
Watertown	92	43	64.4	1.60	
Waverly	94	34	63.2	3.37	
Wedgwood	90	40	61.6	3.74	
West Berne	92	35	62.5	2.76	
Westfield	86	35	61.8	4.04	
Westpoint	90	43	65.7	3.53	
Windham	90	35	60.0	2.77	
Youngstown				2.67	
North Carolina.					
Beaufort	87	56	74.1	8.00	
Brevard	88	40	67.1	4.31	
Brewers	92	43	67.8	11.27	
Buck Spring				5.20	
Carl	96	46	71.5	5.26	
Caroleen	91	54	73.0	9.48	
Chalybeate Springs	92	47	71.2	5.48	
Chapelhill	95	50	71.8	9.51	
Clinton	90	55	72.9	8.71	
Eagletown	92	49	69.4	6.06	
Edenton	90	50	70.0		

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
North Carolina—Cont'd.	°	°	-	*Ins.*	*Ins.*
Fayetteville	91	53	72.4	6.95	
Goldsboro	98	49	72.9	6.15	
Graham	.....	.....	.....	6.09	
Greensboro	92	51	70.8	5.67	
Greenville	.....	.....	.....	6.99	
Henderson	88	49	68.4	8.69	
Hendersonville	84	45	67.4	5.67	
Horse Cove	80	48	66.6	4.46	
Hot Springs	91	45	70.1	5.02	
Kinston	98	49	73.4	9.07	
Lexington	94	45	70.6	5.09	
Lincolnton	94	50	73.0	7.00	
Louisburg	91	50	70.1	9.24	
Lumberton	96	53	74.2	8.41	
Manteo	89	53	69.6	8.03	
Marion	90	49	69.6	5.84	
Moncure	91	50	71.4	8.98	
Monroe	91	44	71.0	8.39	
Morganton	88	47	68.8	10.43	
Mountairy	91	40	67.4	7.79	
Mount Holly	.....	.....	.....	5.65	
Nashville	93	47	70.0	10.50	
New Berne	92	49	72.6	8.34	
Patterson	85	45	64.8	7.87	
Pinehurst	92	53	72.6	7.17	
Ramseur	94	46	71.4	5.60	
Reidsville	92	48	70.6	7.70	
Salem	90	46	69.0	5.94	
Salisbury	94	45	71.2	7.66	
Sapphire	81	37	63.0	5.64	
Saxon	88	46	67.8	8.30	
Scotland Neck	92	49	70.6	6.41	
Selma	93[f]	50[f]	73.4[f]	8.22	
Settle	99	44	68.4	5.97	
Sloan	91	49	72.9	7.34	
Snowhill	95	48	72.3	5.72	
Southern Pines	93	53	73.2	9.53	
Southport	92	57	74.8	10.24	
Statesville	92	45	69.2	4.70	
Tarboro	95	48	72.0	5.59	
Vade Mecum	88	41	66.2	7.74	
Washington	93	50	71.8	11.85	
Wash Woods	90	45	69.2	4.64	
Waynesville	81	41	64.3	4.60	
Whiteville	92	53	74.1	6.43	
Weldon	93	48	70.6	8.52	
North Dakota.					
Amenia	93	34	63.0	3.40	
Aplin	88	26	62.0	1.90	
Beach	84	32	60.0	3.90	
Berlin	93	30	61.6	2.27	
Bottineau	84	33	60.3	1.90	
Buford	85	35	61.6	3.40	
Cando	87	29	60.8	5.58	
Chilcot	87	30	58.8	2.46	
Churchs Ferry	85[e]	37[e]	63.0[e]	3.24	
Coalharbor	87	31	61.4	2.39	
Cooperstown	86	31	63.6	3.91	
Crosby	87	32	61.0	2.89	
Dickinson	86	30	60.4	2.52	
Donnybrook	90	30	59.7	1.34	
Dunseith	87	31	60.4	2.11	
Edgeley	86	33	63.3	1.73	
Edmore	88	31	63.4	2.78	
Flasher	88	27	64.8	2.20	
Forman	.....	.....	.....	3.21	
Fort Berthold	87	27	62.6	3.05	
Fort Yates	87[i]	34[i]	62.6[i]	3.73	
Fullerton	87	36	62.2	4.25	
Gladys	83	35	59.0	2.99	
Glenullin	93	27	62.6	1.80	
Goforth	87	30	60.2	2.82	
Granville	88	35	61.6	2.28	
Hannah	85	31	58.8	1.40	
Hendley	92	31	65.3	1.96	
Hillsboro	90	37	64.4	3.87	
Jamestown	90	32	63.8	2.20	
Kulm	89	36	63.9	1.41	
Lakota	86	30	60.8	4.45	
Langdon	84	32	60.0	1.39	
Larimore	87	33	62.0	3.92	
Lisbon	87	35	61.6	2.98	
McKinney	88	32	61.8	1.41	
Manfred	88	32	62.4	2.54	
Mayville	87	36	63.4	5.08	
Medora	89	29	61.6	2.85	
Melville	95[e]	36[e]	62.4[e]	1.95	
Minot	88	33	62.2	2.13	
Minto	89[e]	37[e]	63.0[e]	4.13	
Napoleon	92	30	61.0	2.80	
New England	.....	.....	.....	2.70	
New Salem	88	34	61.8	2.42	
Oakdale	85	34	61.4	2.77	
Oriska	85	36	62.2	3.30	
Palermo	84[e]	25[e]	59.0[e]	2.37	
Park River	88	36	63.1	4.01	
Pembina	93	30	62.9	2.39	
Portal	84	30	57.8	2.25	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
North Dakota—Cont'd.	°	°	°	*Ins.*	*Ins.*
Power	88	32	62.0	4.73	
Pratt	88	29	60.6	2.08	
Steele	87	32	62.8	2.91	
University	87	30	62.8	4.63	
Valley City	88	35	64.2	2.43	
Washburn	94	32	62.6	4.10	
Westhope	84	32	62.0	2.95	
Willow City	94	35	64.8	1.80	
Wishek	88	34	62.9	1.70	
Ohio.					
Akron	89	42	64.4	3.62	
Amesville	96	41	68.0	3.49	
Bangorville	88	42	64.8	4.07	
Bellefontaine	89	41	64.6	4.65	
Benton Ridge	90	41	65.6	5.97	
Bladensburg	89	39	64.8	2.06	
Bowling Green	90	39	64.8	4.40	
Bucyrus	90	39	64.2	5.73	
Cadiz	91	44	66.0	3.71	
Cambridge	89	42	64.5	4.27	
Camp Dennison	93	49	68.4	4.47	
Canal Dover	92	44	65.0	3.31	
Canton	88	43	63.8	5.57	
Cardington	87	40	64.2	4.39	
Circleville	91	45	66.8	4.85	
Clarington	91	43	66.2	4.35	
Clarksville	91	50	67.6	5.75	
Cleveland[b]	90	46	64.3	5.57	
Columbus	89	46	68.4	4.62	
Dayton	90	48	67.9	3.98	
Defiance	89	40	65.1	6.61	
Delaware	90	41	65.0	3.27	
Demos	92	47	65.6	4.68	
Findlay	90	43	65.6	6.53	
Frankfort	93	44	68.0	3.32	
Fremont	92	42	66.0	5.20	
Garrettsville	89	38	61.8	3.96	T.
Granville	90	43	65.8	3.06	
Gratiot	88	41	65.1	3.63	
Green	91	42	68.3	6.37	
Greenhill	88	36	61.8	3.44	
Greenville	91	44	66.8	9.48	
Hedges	90	40	65.0	4.75	
Hillhouse	89	39	62.4	6.14	
Hiram	87	40	63.2	4.31	
Hudson	94	38	63.9	4.21	
Ironton	92	46	69.4	5.74	
Jacksonburg	90	50	68.4	2.73	
Jeffersonville	88[d]	46[d]	65.6[d]	4.40	
Kenton	89	41	64.2	4.08	
Killbuck	90	41	63.2	3.96	
Lancaster	88	45	66.2	4.57	
Lima	88	45	64.6	3.75	
McConnelsville	90	43	66.0	3.19	
Marietta	91	47	68.2	6.88	
Marion	93	40	65.7	5.44	
Medina	90	38	63.9	4.47	
Milfordton	88	40	64.0	4.44	
Milligan	92	39	65.4	3.46	
Millport	88	39	63.2	2.91	
Montpelier	90	40	64.6	4.26	
Napoleon	90	42	65.0	4.83	
Nellie	85	46	64.0	4.07	
New Alexandria	91	40	65.8	4.65	
New Berlin	92	40	63.5	4.96	
New Bremen	88	41	66.0	6.43	
New Richmond	89	50	68.6	4.35	
New Waterford	89	39	62.6	3.92	
North Lewisburg	93	45	67.4	5.30	
North Royalton	88	39	63.4	4.95	
Norwalk	91	38	64.4	4.40	
Oberlin	91	39	64.0	4.11	
Ohio State University	.....	.....	.....	5.33	
Ottawa	90	41	65.7	4.89	
Pataskala	89	43	65.8	3.35	
Philo	90	46	66.0	5.07	
Plattsburg	88	47	66.1	5.28	
Pomeroy	95	46	68.0	6.34	
Portsmouth	93	48	67.9	3.77	
Pulse	90	48	67.0	3.59	
Rittman	92	40	64.3	6.39	
Rockyridge	91	41	65.3	5.87	
Rome[f]	94	36	64.2	.....	
Shenandoah	88	40	63.0	4.77	
Sidney	90	44	67.3	6.18	
Somerset	92	45	67.4	4.29	
South Lorain	91	39	64.0	5.12	
Springfield	.....	.....	.....	6.73	
Summerfield	92	40	65.8	4.36	
Thurman	90	45	68.0	5.36	
Tiffin	89	44	65.4	4.35	
Toledo (St. Johns College)	89	44	65.9	4.09	
Upper Sandusky	88	40	64.9	5.22	
Urbana	90	43	66.4	5.04	
Vickery	92	41	64.8	5.62	
Warren	93	39	63.8	3.83	
Wauseon	91	39	64.8	4.55	
Waverly	93	43	68.4	3.91	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Ohio—Cont'd.	°	°	°	*Ins.*	*Ins.*
Waynesville	86	49	66.2	3.44	
Wellington	91	41	65.0	3.70	
Willoughby	.....	.....	.....	5.64	
Wilson	93	44	68.2	5.06	
Wooster	90	40	64.6	3.81	
Zanesville	.....	.....	.....	3.92	
Oklahoma.					
Alva	97	47	74.8	4.52	
Arapaho	94	44	73.8	8.06	
Beaver	100[e]	42[e]	73.0[e]	5.23	
Brule	101	35	75.7	3.80	
Cache	95	41	73.6	4.95	
Chandler	98	50	77.0	4.88	
Chattanooga	103	50	76.5	2.60	
Cloud Chief	97	47	75.0	6.76	
Dacoma	97	43	73.6	4.41	
Enid	95	50	74.4	4.76	
Erick	98	52	73.4	8.94	
Fort Reno	96	42	75.6	7.37	
Fort Sill	98	48	77.3	4.77	
Frederick	98	50	77.9	1.50	
Gage	97	40	72.6	6.52	
Grand	98	41	71.6	9.82	
Guthrie	93	48	75.4	5.80	
Harrington	97	46	71.2	5.47	
Helena	94	49	73.4	3.50	
Hennessey	96	48	75.2	6.04	
Hobart	100	49	76.2	5.08	
Holdenville	91	50	74.8	2.52	
Hooker	100	44	72.5	5.95	
Jefferson	94	48	74.6	8.34	
Kenton	100	45	69.2	1.27	
Kingfisher	93	46	74.8	7.76	
McComb	92	50	75.0	3.57	
Mangum	100	55	77.2	5.30	
Meeker	94	50	75.2	4.90	
Neola	95	48	74.6	5.03	
Newkirk	98	50	75.0	7.85	
Norman	93	49	76.4	5.73	
Okeene	99	49	75.1	6.26	
Pawhuska	95	46	74.0	7.59	
Perry	95	46	74.2	8.16	
Sac and Fox Agency	92	51	75.5	5.05	
Shawnee	93	50	75.5	4.98	
Snyder	101	48	76.2	4.40	
Stillwater	93	50	74.2	9.75	
Temple	101	48	81.8	3.89	
Waukomis	95	50	74.2	5.41	
Weatherford	96	49	74.4	8.15	
Whiteagle	97	48	74.4	7.09	
Oregon.					
Alba	.....	.....	.....	3.22	
Albany	95	42	60.7	1.30	
Alpha	93	38	59.4	2.38	
Ashland	93	36	61.4	1.14	
Astoria	70	46	59.2	2.67	
Aurora (near)	90	40	60.2	2.16	
Bay City	.....	.....	.....	4.40	
Bend	89	28	53.8	1.79	
Black Butte	92	36	58.7	2.54	
Blalock	99	43	68.0	0.91	
Buckhorn	91	37	59.7	2.40	
Bullrun	92	42	59.6	5.17	
Burns	85	30	55.5	1.59	
Carlton	95	40	58.8	0.94	
Cascade Locks	91	45	61.0	2.19	
Coquille	.....	.....	.....	3.74	
Corvallis	95	40	61.1	1.11	
Dale	.....	.....	.....	2.82	T.
Dayville	97	36	60.8	1.09	
Doraville	90	38	58.1	2.76	
Drain	98	38	60.2	1.95	
Echo	97	44	65.6	0.36	
Ella	99	41	62.8	0.48	
Eugene	91	42	60.0	1.40	
Fairview	80	40	55.8	2.65	
Falls City	90	37	58.0	1.62	
Glendale	95	36	59.7	0.96	
Glenora	92	34	58.2	3.01	
Gold Beach	68	38	55.0	5.77	
Government Camp	79	32	47.9	3.80	T.
Granite	81	29	50.4	0.74	
Grants Pass	99	35	62.0	1.05	
Grass Valley	90	27	56.0	0.89	
Heppner	92	39	60.6	0.92	
Hermiston	.....	.....	.....	0.27	
Hood River	94	46	64.4	0.49	
Huntington	99	22	58.8	0.80	
Jacksonville	95	35	62.9	0.67	
Joseph	83	28	52.9	1.71	T.
Lagrande	91	34	57.6	2.10	
Lakeview	98	22	56.2	2.76	
Lost River	84	29	54.5	1.10	
McKenzie Bridge	95	36	58.6	4.35	
McMinnville	97	36	60.3	1.43	
Marshfield	72	40	56.8	3.22	
Mill City	94	38	60.6	0.92	
Monroe	91	41	59.8	1.27	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Oregon—Cont'd.	°	°	°	*Ins.*	*Ins.*
Mountain Park	88	40	59.0	1.48	
Mount Angel	95	42	62.1	2.70	
Nehalem				4.03	
Newport	70	43	57.2	2.90	
Odell				0.52	T.
Olex (near)	92	40	61.4	1.46	
Ontario				1.67	
Orseco	80	29	48.3	4.97	T.
Paisley	83	28	55.8	2.80	
Pendleton	97	38	62.8	1.22	
Port Orford	68	44	55.0	5.17	
Prineville	89	28	55.9	1.01	
Richland	92	34	61.8	1.42	
Salem	92	44	61.8	1.55	
Silver Lake	89	25	54.2	0.71	
Stafford	93	40	60.0	2.69	
The Dalles	95	46	65.9	0.42	
Toledo	81	41	57.4	4.16	
Umatilla	98	50	68.8	0.37	
Van				1.28	
Wallowa	89	32	55.6	1.64	T.
Wamic	90°	29°	57.1°	0.80	
Weston	91	38	59.7	2.47	
Williams	95	35	61.4	1.08	
Pennsylvania.					
Aleppo	91	39	64.8	3.90	
Altoona	86	38	61.2	5.69	
Baldwin	87	38	62.0	4.83	
Beaver Dam				4.85	
Bellefonte	93	40	66.4	5.33	
Browers Lock				6.18	
California	92	40	66.0	4.36	
Cassandra	86	38	60.7	6.90	T.
Centerhall	92	39	64.7	5.23	
Clarion				5.38	
Claysville	98	36	64.9	4.43	
Clearfield				5.56	
Coatsville	92	42	65.2	6.92	
Confluence				5.99	
Coraopolis				3.58	
Davis Island Dam				3.28	
Derry	92	39	64.3	5.99	
Doylestown				6.19	
Drifton	89	39	61.2	5.67	
East Mauch Chunk	91	41	63.2	5.22	
Easton	89	43	65.7	3.84	
Ellwood Junction				4.94	
Emporium	88	38	62.0	7.64	
Ephrata	88	43	63.6	5.55	
Everett	87	39	64.0	6.04	
Forks of Neshaminy				5.42	
Franklin	89	35	62.6	4.54	
Freeport	91	41	66.2	3.41	
George School	90	44	64.4	4.78	
Gettysburg	91	44	64.8	5.57	
Girardville				4.99	
Gordon	88	37	61.6	4.98	
Greenville	87	35	62.0	6.79	
Grove City	89	37	62.5	3.04	
Hamburg	90	41	65.0	3.65	
Hanover	92	45	66.4	4.77	T.
Herrs Island Dam				3.88	
Huntingdon	88	37	63.4	4.99	
Hyndman	91	37	63.1	8.55	
Indiana	94[b]	38°	63.0[b]	4.62	
Irwin	93	39	85.3	5.17	
Johnstown	91	41	64.2	5.21	
Kennett	87	42	63.0	7.41	
Lansdale				5.37	
Lawrenceville	94	38	62.7	4.59	
Lebanon	90	32	65.1	3.33	
Leroy	87	40	61.4	4.13	
Lewisburg	88	41	65.0	3.61	
Lockhaven	92	42	65.6	4.35	
Lock No. 4				3.81	
Lycippus	90	43	64.2	4.42	
Marion	92	43	65.2	4.78	
Mauch Chunk				5.22	
Mifflintown	87	39	64.0	4.64	
Milford	92	34	62.2	3.52	
Montrose	87	36	60.2	2.79	
New Germantown	87	42	65.4	5.50	
Ottsville				4.67	
Parker				7.24	
Philadelphia	92	47	67.3	4.82	
Pocono Lake	86	30	58.4	5.69	
Point Pleasant				4.72	
Pottsville				5.20	
Reading	91	42	65.5	4.81	
Renovo				6.00	
Saegerstown	88	34	61.0	7.49	
St. Marys	87	38	60.8	5.65	
Saltsburg				4.08	
Seisholtzville				5.10	
Selinsgrove	87	41	64.5	4.80	
Shawmont				3.88	
Skidmore	88	37	62.4	4.08	
Smiths Corners				4.86	

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Pennsylvania—Cont'd.	°	°	°	*Ins.*	*Ins.*
Somerset	87	38	60.0	7.60	
South Eaton	86	42	63.0	5.27	
Springmount				4.49	
State College	85	42	62.2	4.63	
Towanda	89	39	62.6	3.16	
Uniontown	91	42	65.0	5.20	
Warren	88	35	61.0	4.69	
Wellsboro	90	35	61.2	4.39	
Westchester	90	45	65.6	7.01	
White Haven	86	35	60.8	6.38	
Wilkesbarre	98	42	65.9	3.56	T.
Williamsport	86	42	64.6	7.16	
Rhode Island.					
Bristol	80	42	59.8	1.31	
Kingston	86	39	60.7	2.95	
Pawtucket				3.10	
Providence				2.68	
South Carolina.					
Aiken	97	55	76.7	4.92	
Allendale	95	59	78.2	7.01	
Anderson	94	51	74.0	4.01	
Barksdale	95	53	73.8	7.08	
Batesburg	96	54	75.8	4.06	
Beaufort	95	62	77.4	6.83	
Bennettsville	93	53	75.2	5.58	
Blackville	99	56	79.0	7.29	
Blairs				6.04	
Bowman	97	57	77.2	5.02	
Calhoun Falls				4.10	
Camden	92	55	74.3	5.82	
Catawba				8.36	
Cheraw	93	56	74.3	8.55	
Clarks Hill	97	54	77.3	4.95	
Clemson College	90	54	73.0	2.22	
Conway	93	56	75.2	10.21	
Darlington	95	55	74.4	12.38	
Dillon	95	50	74.7	6.75	
Due West	91	55	74.2	5.07	
Edisto				10.90	
Effingham				8.90	
Florence	99	57	76.2	7.21	
Georgetown	93	62	77.6	4.88	
Greenville	87	49	70.0	6.90	
Greenwood	93	55	74.4	6.32	
Heath Spring	94	58	76.6	5.27	
Kingstree	94	62	78.2	6.11	
Liberty	93	50	74.0	4.20	
Little Mountain	96	55	76.0	2.68	
Newberry	96	54	76.2	2.90	
Pinopolis	90	62	76.1	4.44	
St. George	93	64	79.0	4.91	
St. Matthews	91	57	74.8	8.60	
St. Stephen				7.02	
Saluda	97	50	75.4	3.32	
Santuck	95	53	73.3	4.28	
Smiths Mills				4.50	
Society Hill	92	55	74.8	7.25	
Spartanburg	95	52	73.8	8.28	
Summerville	95	55	76.8	3.70	
Trenton	95	55	76.0	2.66	
Trial	93	55	78.2	5.33	
Walhalla	93	47	72.2	4.55	
Walterboro	96	58	76.5	5.84	
Winnsboro	94	57	75.1	5.73	
Winthrop College	92	54	73.6	6.09	
Yemassee	92	60	75.6	6.32	
Yorkville	93	54	75.4	5.46	
South Dakota.					
Aberdeen	89	37	64.0	3.02	
Academy	92	40	66.4	2.66	
Alexandria	91	36	66.3	7.21	
Armour	96	37	67.0	5.94	
Ashcroft	87	27	61.1	4.48	
Bowdle	90	34	64.6	1.69	
Brookings	94	34	64.6	5.65	
Canton	92	38	66.0	4.23	
Castlewood	88	35	61.6	4.25	
Centerville	91	40	65.8	5.45	
Chamberlain	96	37	66.6	0.56	
Cherry Creek	97	33	66.8	0.85	
Clark	89	35	63.1	2.98	
Clear Lake	87	39	62.6	5.06	
Desmet	87	38	63.2	5.10	
Elkpoint	94	41	67.2	4.80	
Fairfax	90	40	65.4	3.21	
Farmingdale				2.38	
Faulkton	88	35	63.1	1.50	
Flandreau	90	33	63.4	7.46	
Forestburg	88	35	62.8	3.91	
Fort Meade	85	37	61.4	8.10	
Frederick	86	33	63.0	2.65	
Gannvalley	93	35	65.2	2.86	
Greenwood	92	38	67.4	5.53	
Hermosa	89	40	63.0	4.30	
Highmore	90	36	64.2	1.62	
Howard	86	35	62.8	5.21	
Howell	90	32	64.1	2.58	
Ipswich	95	33	65.0	1.50	

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
South Dakota—Cont'd.	°	°	°	*Ins.*	*Ins.*
Kenebec				1.18	
Kidder	88	33	62.4	8.72	
Kimball	91[f]	40	66.1°	1.85	
La Delle	88	33	64.6	3.77	
Little Eagle	92	30	64.4	2.62	
Marion	97	39	66.8	6.23	
Mellette	94	31	63.6	2.10	
Menno	90	35	65.2	6.32	
Mill Bank	88	40	62.8	6.06	
Mitchell	93	37	64.9	4.25	
Mound City	90	32	62.8	2.25	
Oelrichs	92	41	63.7	3.85	
Orman	87	36	62.8	3.02	
Plankinton	92°	36°	66.9°	3.97	
Ramsey	88	30	62.6	8.79	
Redfield	89	32	63.3	2.10	
Roslyn	85	35	61.4	3.47	
Sioux Falls				5.26	
Spearfish	86	38	61.2	6.71	
Stephan	90	34	63.7	0.44	
Vermillion				3.23	
Watertown	83[i]	36[h]	64.2[h]	2.80	
Wentworth	88	38	63.4	7.18	
Wessington Springs	90	40	64.8	2.17	
Whitehorse	93	30	65.2	1.22	
Woolsey				2.72	
Tennessee.					
Arlington	96	50	74.3	2.03	
Ashwood	90	47	71.0	3.29	
Benton	92	46	72.0	9.23	
Birds Bridge				7.38	
Bluff City				7.02	
Bolivar	93	47	73.6	4.91	
Bristol	89	45	67.7	5.73	
Brownsville	91	50	74.4	1.98	
Byrdstown	92	47	71.2	4.46	
Carthage	94	49	73.5	4.85	
Cedar Hill	95	53	73.6	3.95	
Celina				5.05	
Charleston				3.53	
Clarksville	91	52	71.8	3.48	
Clinton				5.80	
Covington	95	52	75.5	2.05	
Dandridge				5.80	
Decatur	94	44	72.3	5.03	
Dickson	95	47	72.8	3.76	
Dover	95	46	73.0	2.66	
Dyersburg	94	50	74.8	3.58	
Elizabethton	87	46	68.8	6.96	
Erasmus	89	37	66.1	5.06	
Florence	88	49	71.6	5.44	
Halls Hill				3.60	
Harriman	92	49	71.0	1.38	
Hohenwald	90	39	71.2	4.78	
Iron City	90	45	70.8	2.64	
Jackson	94	46	74.5	1.96	
Johnsonville	93	46	73.2	3.13	
Kenton	93	47	73.9	4.87	
Kingston				3.21	
Lafayette	92	46	70.8	5.56	
Lewisburg	93	46	72.8	2.44	
Loudon				6.40	
Lynnville	91	41	72.7	3.34	
McGee				6.10	
McMinnville	91	45	70.5	3.68	
Maryville	91	46	71.6	4.67	
Milan	92	46	72.6	3.27	
Newport	87	48	70.8	6.95	
Palmetto	93	47	72.9	1.63	
Pinewood	90	44	71.2	3.56	
Pope	94	46	73.0	3.80	
Rogersville	89	44	69.2	5.61	
Rugby	91	37	68.0	4.58	
Savannah	92	49	72.6	1.72	
Sevierville	92	44	70.9	5.51	
Sewanee	85	48	69.2	6.69	
Silver Lake	82	43	64.0	7.75	
Sparta	92	46	70.8	3.70	
Springdale	92	52	73.2	6.17	
Springville	92	48	72.3	1.75	
Tazewell				6.02	
Tellico Plains	91	45	71.6	9.62	
Tracy City	85°	42°	66.8°	4.83	
Trenton	92	49	72.8	1.97	
Tullahoma	93	45	71.5	4.87	
Union City	90	49	74.3	3.28	
Walling				2.65	
Waynesboro	90	46	71.8	2.30	
Wildersville	86	50	72.1	1.08	
Yukon	94	50	73.4	2.97	
Texas.					
Albany	109	50	79.4	3.75	
Alvin				0.33	
Arthur				2.62	
Austin				2.74	
Ballinger	116	50	83.4	0.19	
Barstow	110	58	82.4	0.06	
Beaumont				0.93	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Texas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Beeville	107	58	82.7	0.00	
Big Spring	117	50	83.4	0.86	
Blanco	98	49	78.6	1.54	
Boerne	104	52	78.7	0.20	
Booth	.....	.....	.....	1.02	
Bowie	104	51	79.8	2.04	
Brazoria	100	57	80.2	0.01	
Brenham	99	59	80.2	1.16	
Brownwood	104	50	82.1	5.42	
Canadian	95	47	73.4	5.90	
Channing	104	41	76.8	3.05	
Childress	104	49	76.4	3.90	
Chillicothe	.....	.....	.....	2.58	
Clarendon	.....	.....	.....	5.48	
Clarksville	98	51	79.5	1.82	
Claytonville	110	51	80.0	3.20	
Coleman	.....	.....	.....	4.15	
College	97	60	76.6	0.40	
Colorado	115	48	81.4	2.33	
Corsicana	97	58	82.0	2.50	
Cotulla	104	69	84.0	0.45	
Crockett	98	55	80.7	1.15	
Cuero	101	59	84.4	0.20	
Dalhart	103	42	72.0	3.27	
Dallas	96	55	78.8	3.68	
Danevang	100	60	81.5	0.00	
Decatur	99	40	75.0	2.75	
Denison	.....	.....	.....	1.52	
Dialville	95	54	78.8	1.04	
Dublin	102	55	79.6	3.09	
Duval	97	57	79.9	1.93	
Earls Ranch	.....	.....	.....	0.94	
Falfurrias	107	60	86.0	1.35	
Fort Clark	107	55	81.8	2.05	
Fort Davis	104	42	70.2	0.00	
Fort McIntosh	109	56	86.0	0.07	
Fort Stockton	114	48	82.0	0.61	
Fredericksburg	102	50	79.8	0.41	
Gatesville	101	53	80.5	1.50	
Georgetown	101[4]	55[4]	79.8[4]	1.83	
Gonzales	.....	.....	.....	0.77	
Graham	110	49	80.4	0.51	
Grapevine	.....	.....	.....	3.25	
Greenville	98	53	79.3	2.01	
Hale Center	.....	.....	.....	1.38	
Hallettsville	101	59	82.4	0.47	
Haskell	113	51	81.2	1.12	
Hemstead	.....	.....	.....	0.70	
Henrietta	116	53	81.2	2.03	
Hereford	103	42	72.2	0.72	
Hillsboro	100	51	79.8	3.52	
Hondo	105	59	83.2	T.	
Houston	100	59	80.8	0.94	
Hubbard	97	59	79.8	3.40	
Huntsville	101	56	81.0	T.	
Jewett	92	50	78.0	3.30	
Junction	.....	.....	.....	1.03	
Kaufmann	96	54	80.4	3.02	
Keene	102	56	80.0	1.77	
Kerrville	100	54	79.4	1.52	
Knickerbocker	113	44	83.2	T.	
Kingsville	.....	.....	.....	1.54	
Lampasas	104	51	80.7	1.09	
Lapara	.....	.....	.....	0.00	
Laureles	.....	.....	.....	0.00	
Liberty	98	57	79.9	2.20	
Llano	106	55	82.5	1.30	
Long Lake	.....	.....	.....	2.94	
Lone Star Ranch	.....	.....	.....	1.09	
Longview	98	54	80.6	0.68	
Lufkin	97	51	80.2	0.20	
Luling	99	57	81.1	3.03	
Marfa	.....	.....	.....	1.44	
McLean	93	45	72.0	5.87	
Memphis	105	50	77.0	4.41	
Mexia	96	55	78.4	2.09	
Miami	99	43	73.4	5.18	
Mount Blanco	104	45	75.0	4.15	
Nacogdoches	92	53	78.6	0.21	
Nazareth	102	60	78.4	2.30	
Orange	.....	.....	.....	0.00	
Panter	.....	.....	.....	1.86	
Paris	93	51	77.5	3.20	
Pierce	88	53	76.3	0.31	
Plemons	101	42	71.0	3.56	
Port Lavaca	95	60	81.8	1.87	
Quanah	103	50	79.8	5.11	
Ravenna	.....	.....	.....	4.35	
Rhineland	112	50	78.4	2.75	
Rockisland	97	58	80.2	0.54	
Rockland	.....	.....	.....	0.00	
Rossville	.....	.....	.....	0.22	
Sabinal	109	53	84.0	0.69	
San Marcos	98	56	79.9	3.57	
San Saba	105	50	81.6	2.17	
Santa Gertrude	.....	.....	.....	1.54	
Seymour	106	51	79.4	1.43	
Sherman	92	50	78.8	4.37	
Sugarland	96	58	79.6	0.49	
Sulphur Springs	93	54	70.0	2.08	
Temple	100	52	79.8	1.19	
Texline	.....	.....	.....	1.33	
Uvalde	.....	.....	.....	0.38	
Valley Junction	.....	.....	.....	0.00	
Victoria	98	59	81.6	0.92	
Waco	104	58	83.4	1.85	
Waxahachie	99	53	79.8	1.34	
Weatherford	105	54	81.6	1.30	
Wharton	101	58	80.5	0.04	
Wichita Falls	108	54	79.4	2.78	
Willis	103	56	81.4	0.45	
Willspoint	96	52	76.8	2.29	
Utah.					
Alpine	.....	.....	.....	1.77	
Aneth	98	43	70.5	0.54	
Annabella	.....	.....	.....	0.80	
Blackrock	94	31	60.7	0.53	
Castledale	91	31	59.5	1.16	
Castlerock	.....	.....	.....	1.26	
Corinne	98	35	63.6	2.10	
Deseret	90	22	58.2	1.07	
Emery	86	29	56.5	0.55	
Enterprise	.....	.....	.....	0.64	
Experiment Farm	100	40	70.0	.....	
Farmington	89	32	58.0	2.00	
Fillmore	96	30	62.9	0.88	
Fort Duchesne	92	32	59.0	0.72	
Garrison	91	27	60.2	0.20	
Government Creek	88	28	57.5	1.96	
Grayson	90	30	61.2	0.43	
Heber	86	28	55.2	1.47	
Henefer	85	26	54.6	1.48	
Hite	103	48	72.4	0.48	
Huntsville	.....	.....	.....	2.08	
Ibapah	79	22	48.8	2.77	
Kanab	91	24	58.2	0.40	
Kelton	.....	.....	.....	1.30	
Levan	87	29	58.0	1.35	
Loa	85	23	51.6	0.35	
Logan	81	38	60.5	2.34	
Lucin	84	16	49.6	1.54	
Manti	88	29	57.6	1.33	
Marion	.....	.....	.....	1.93	
Marysvale	87	26	56.4	0.44	
Meadowville	75	27	51.8	1.49	
Millville	.....	.....	.....	2.22	
Minersville	.....	.....	.....	1.05	
Moab	97	38	68.0	0.37	
Morgan	87	28	54.6	1.37	
Mount Nebo	87	34	63.1	1.06	
Mount Pleasant	95	30	58.4	1.25	
Nephi	.....	.....	.....	1.30	
Oak City	95	29	62.8	1.37	
Ogden	88	38	60.8	3.27	
Park City	77	19	51.0	2.38	1.5
Parowan	89	27	59.1	0.31	
Payson	.....	.....	.....	1.80	
Pinto	88	25	55.2	0.62	
Plateau	87	20	52.6	0.69	
Provo	88	32	59.8	1.70	
Ranch	82	25	52.8	0.34	
Randolph	.....	.....	.....	1.83	
Richfield	99	29	61.2	0.15	
St. George	105	43	74.0	0.05	
Saltair	80	38	60.4	2.24	T.
Scipio	91	24	57.8	1.22	
Snowville	83	25	54.7	1.63	
Soldier Summit	70	16	43.2	0.05	T.
Springdale	100	38	70.0	0.00	
Sunnyside	.....	.....	.....	1.45	
Theodore	88	33	57.9	1.61	
Thistle	90	28	58.0	1.30	
Tooele	87	32	59.7	1.68	
Torrey	.....	.....	.....	0.31	
Tropic	90	32	57.0	0.67	
Trout Creek	90	27	58.3	0.68	
Vernal	93	38	63.8	0.50	
Woodruff	78	25	50.2	2.23	
Vermont.					
Bloomfield	94	32	61.2	8.54	
Cavendish	93[f]	33[f]	64.7[f]	2.38	
Chelsea	90	36	60.4	3.93	
Enosburg Falls	92	33	62.6	4.70	
Jacksonville	90	32	60.2	3.47	
Manchester	85	35	60.6	4.26	
Norwich	94	36	61.5	3.57	
St. Johnsbury	95	34	63.2	3.38	
Wells	88	38	62.7	2.33	
Woodstock	92	36	59.7	3.87	
Virginia.					
Arvonia	93	44	66.2	6.12	
Ashland	92	50	66.7	5.16	
Bigstone Gap	85	45	67.4	7.71	
Blacksburg	86	40	62.6	8.40	
Buchanan	.....	.....	.....	7.11	
Burkes Garden	80	34	60.2	9.13	
Callaville	91	48	68.5	7.33	
Cashville	92	45	66.6	4.31	
Charlottesville	89	46	66.3	7.13	
Clarksville	.....	.....	.....	7.55	
Columbia	89	48	66.6	5.63	
Dale Enterprise	88	40	62.5	7.76	
Danville	.....	.....	.....	8.06	
Dinwiddie	92	41	66.4	6.08	
Elk Knob	86	48	67.6	6.93	
Fredericksburg	92	46	66.0	4.12	T.
Galax	84	42	63.8	9.63	
Grahams Forge	84	43	63.5	8.16	
Hampton	90	49	68.6	2.93	
Hot Springs	82	40	61.6	7.43	
Ivanhoe	.....	.....	.....	10.11	
Lexington	89	43	64.8	6.73	
Lincoln	93	43	65.4	6.59	
Marion	86	42	64.4	11.44	
Mendota	.....	.....	.....	7.30	
Newport News	91	50	68.8	3.51	
Nokesville (near)	87	47	65.3	4.35	
Quantico	92	44	66.4	6.35	
Radford	.....	.....	.....	5.78	
Randolph	.....	.....	.....	3.64	
Riverton	.....	.....	.....	4.85	
Roanoke	90[d]	48[d]	67.8[d]	6.70	
Rocky Mount	88	40	66.2	6.88	
Shenandoah	.....	.....	.....	4.51	
Speers Ferry	.....	.....	.....	7.02	
Spottsville	92	45	67.7	5.41	
Staunton	88	44	65.0	6.54	
Stephens City	92	43	64.9	6.73	
Warsaw	92	44	66.4	5.80	
Williamsburg	92	46	67.4	3.91	
Woodstock	92	44	64.7	4.11	
Washington.					
Aberdeen	74	36	54.0	1.59	
Anacortes	77	38	56.8	0.93	
Ashford	.....	.....	.....	4.63	
Bellingham	81	38	58.2	0.66	
Bogachiel	92	38	60.6	2.58	
Cedar River	.....	.....	.....	1.74	
Cedonia	79	38	56.1	1.34	
Centralia	96	36	59.6	2.08	
Cheney	.....	.....	.....	1.35	
Clearbrook	86	32	57.3	1.79	
Clearwater	86	40	58.6	3.24	
Cle Elum	88	32	56.0	0.90	
Colville	93	36	59.2	1.91	
Conconully	87	36	58.6	1.84	
Coupeville	81	36	57.9	0.68	
Crescent	89	33	58.6	0.74	
Cusick	88	40	61.6	1.75	
Dayton	87	39	60.6	1.73	
East Sound	84	37	57.5	0.95	
Ellensburg	93	38	59.6	1.37	
Ephrata	92	40	64.3	0.90	
Fort Simcoe	89	39	62.0	2.05	
Granite Falls	.....	.....	.....	2.53	
Hatton	96	31	63.0	0.45	
Hoodsport	94	38	58.8	.....	
Huntsville	.....	.....	.....	0.76	
Kennewick	97	46	66.8	0.35	
Kiona	97	44	66.6	0.30	
Kosmos	94	39	60.7	2.11	
Lacenter	94	42	59.8	2.51	
Lakeside	92	43	64.4	1.96	
Lester	92	35	58.0	1.35	
Loomis	.....	.....	.....	1.56	
Lucerne	86	43	61.2	0.65	
Mottinger Ranch	102	45	68.6	0.59	
Mount Pleasant	89	41	59.6	2.77	
Moxee	94	40	63.4	1.15	
Northport	90	31	57.4	1.69	
Odessa	92	33	61.6	2.54	
Olga	71	42	56.4	0.79	
Olympia	92	38	60.9	1.50	
Pinehill	96	43	63.4	0.51	
Pomeroy	87[4]	38[d]	60.8[d]	1.41	
Port Townsend	74	43	57.2	1.04	
Pullman	86	34	60.5	1.65	
Quiniault	93	38	59.1	3.02	
Rattlesnake	86	38	58.2	1.26	
Rex Creek	85[e]	44[e]	61.6[e]	0.75	
Ritzville	.....	.....	.....	0.45	
Rock Lake	.....	.....	.....	0.69	
Rosalia	84	34	57.0	1.10	
Ruby Hill	88	33	57.9	1.66	
Sedro	84[e]	37[e]	58.4[e]	2.10	
Sixprong	95	46	65.6	0.87	
Snohomish	82	39	56.8	2.18	
Snoqualmie	90	38	59.8	2.15	
Stehekin	85	43	61.5	0.66	
Stokes	86	39	59.4	2.33	
Touchet	98	42	67.2	0.38	
Trinidad	95	45	67.8	0.18	
Twisp	91	36	61.4	1.13	
Union	96[1]	35[b]	60.0[c]	2.31	

TABLE II.—*Climatological record of cooperative observers*—Continued. *Late reports for May, 1907.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Washington—Cont'd.	°	°	°	*Ins.*	*Ins.*
Vancouver	93	46	62.0	1.80	
Vashon	82	43	59.8	0.84	
Wahluke	99	41	67.8	0.26	
Waterville	86	33	57.4	1.20	
Wenatchee (near)	91	40	61.0	1.84	
Westport				1.91	
Wilbur	89	30	57.4	1.29	
Yale	93	40	61.3	2.59	
Zindel	98	44	67.4	1.54	
West Virginia.					
Bancroft	93	47	68.2	6.71	
Bayard	86	33	59.4	7.11	
Beckley	84	40	62.2	6.82	
Bens Run	93	44	67.9	6.64	
Bluefield				8.86	
Burlington	90	39	63.2	5.46	
Cairo	93[1]	42[1]	68.1[1]		
Central	91	40	65.0	4.54	
Charleston	90	48	69.4	6.27	
Creston	90	40	65.6	5.13	
Cuba	91	42	65.8	4.53	
Davis				7.15	
Elkhorn	86	42	65.2	7.24	
Fairmont	94	38	65.3	4.64	
Franklin	87	41	62.0	8.25	
Glenville	94	43	68.0	6.07	
Grafton	90	39	64.8	4.40	
Green Sulphur Springs	80	39	61.2	7.41	
Harpers Ferry				5.61	
Hinton	88	45	66.4	7.24	
Huntington	94	42	67.9	8.66	
Leonard	80	45	63.0	6.95	
Lewisburg	88	40	63.8	7.17	
Logan	92	48	69.9	7.76	
Lost City	88	43	62.5	5.00	
Lost Creek	91	40	64.6	3.97	
Madison	94	53	71.6	6.20	
Mannington	90	38	65.0	4.96	
Martinsburg	92	44	65.5	5.37	
Moorefield	92	40	64.5	2.56	
Mooresville				3.23	
Morgantown	90	41	64.5	4.33	
Moundsville	93	42	67.8	3.85	
New Cumberland	89	39	65.3	3.88	
New Martinsville	93*	41*	67.8*	4.92	
Nuttallburg				5.67	
Oceana	94	44	68.4	7.71	
Parsons	87	36	62.1	5.42	
Philippi	92	38	64.8	4.76	
Pickens	84	40	61.4	8.69	
Point Pleasant	92	48	69.4	6.10	
Powellton	92	46	67.9	1.93	
Princeton	82	38	61.6	11.95	
Romney	97	44	65.8	4.09	
Rowlesburg				5.76	
Ryan	91	42	66.3	6.58	
Smithfield	93[1]	44[1]	70.2[1]	3.71	
Spencer	93	40	65.2	4.73	
Sutton	92	40	68.8	7.47	
Terra Alta	88	38	61.8	5.05	
Union	91	40	65.2	4.75	
Uppertract	89	40	63.2	7.12	
Wellsburg	86	44	64.3	4.21	
Weston	94	40	65.2	5.90	
Wheeling				4.40	
Williamson	92	48	69.6	10.41	
Woodbine	83	41	62.3	7.14	
Wisconsin.					
Amherst	94	36	65.4	4 30	
Antigo*	98	30	63.8		
Appleton	93	41	65.8	2.66	
Appleton Marsh	94	34	62.4	2.27	
Ashland	98	36	63.2	1.54	
Barron	94	34	63.6	3.39	
Beloit	89	44	66.4	5.01	
Black River Falls				2.09	
Brodhead	91	44	65.8	4.71	
Burnett	87	40	63.0	5.93	
Butternut	92	32	64.4	1.89	
Cecil	94	37	64.8	2.80	
Chilton	91	41	64.5	3.36	
Cranden	90	33	62.8	1.76	
Downing	94	34	63.4	6.24	
Eau Claire	94	40	66.8	3.80	0.5
Florence	91	33	62.9	2.38	
Fond du Lac	91	38	64.1	4.53	
Grand Rapids	92	38	65.0	3.60	
Grand River Locks				3.14	
Grantsburg	93	35	62.7	7.11	
Hancock	95	39	65.0	4.99	
Hayward	92	33	62.0	1.80	
Herbster	96	29	54.6	0.93	
Hillsboro	93	37	63.2	4.12	
Koepenick	95	28	63.2	3.40	
Lake Mills	93	39	65.0	4.83	
Lancaster	90	43	64.8	4.52	
Manitowoc	89	43	60.6	4.65	
Mauston	91	35	63.4	2.72	
Wisconsin—Cont'd.					
Meadow Valley	95	34	63.4	2.99	
Medford	93	35	65.4	3.10	
Menasha				1.72	
Merrill	89	35	64.6	4.07	
Minocqua	89	34*	63.5[f]		
Mount Horeb	89	42	64.6	3.45	
Neillsville	94	35	64.6	3.93	
New London	95	41	65.5	4.80	
New Richmond	91	38	64.6	6.39	
Oconto	94	39	64.2	2.41	
Osceola	91	36	63.4	3.35	
Oshkosh	92[4]	41[4]	64.4[4]	3.57	
Pine River	94	40	64.1	3.04	
Portage	91	43	65.0	2.41	
Port Washington	90	42	61.4	4.25	
Prairie du Chien	94	42	66.4	4.41	
Prentice	91	30	61.6	1.96	
Racine	92	44	63.6	4.45	
Sheboygan	95	44	61.8	3.94	
Shullsburg	87	39	64.0	4.41	
Solon Springs	94	32	62.1	1.84	
Spooner	93	33	64.2	2.18	
Stanley	89	36	62.4	3.74	
Stevens Point	95	35	63.8	2.44	
Sturgeon Bay	86	37	58.6	3.00	
Valley Junction	96	36	63.2	2.91	
Viroqua	88	41	64.4	4.74	
Watertown	90	40	64.0	5.46	
Waukesha				5.03	
Waupaca	97	36	65.1	4.00	
Wausau	92	35	63.6	6.63	
Weyerhauser	91	32	61.8	2.27	
Whitehall	95	33	66.7		
Wyoming.					
Barnum				0.81	
Basin	92	41	64.2	0.53	
Bedford	75	24	48.6	4.28	
Blue Cap	71	26	48.0	2.20	
Border	79	25	51.0	1.69	
Buffalo	84	34	57.4	0.85	
Camp Colter	86	34	58.7	1.46	
Chugwater	83	34	58.4	2.34	
Clark	86	39	60.7	0.71	
Clear Creek Cabin	74	24	47.4	2.15	3.0
Daniel	72	23	46.1	2.62	
Dubois	82	21	49.1	1.43	
Elk Mountain				0.85	
Evanston	74	27	50.0	2.49	
Experiment Farm				0.20	
Fayette	75	22	48.6	2.52	T.
Fontenelle	76	26	50.0		
Fort Laramie	94	35	62.8	3.38	
Granite Canyon	76	28	52.8	2.29	
Granite Springs	82	35	56.2	1.11	
Green River	83	29	54.8	0.30	
Griggs	82	33	57.4	2.63	
Hatton				0.65	
Hyattville	90	63	60.4		
Jackson	76	27	50 3	2.28	
Kirtley	83	36	58.0	2.90	
Laramie	78	31	53.4	0.90	
Leo	77	28	54.0	T.	
Lolabama Ranch	70	27	49.0	1.94	
Lusk	87	37	59.2	3.24	
Moorcroft	90	35	62.4	1.18	
Moore	80	33	56.6	2.18	
Newcastle	84	40	62.0	2.52	
Pathfinder	87	36	59.7	0.75	
Phillips	88	36	59.0	4.34	
Pine Bluff	88	34	60.6	1.92	
Pinedale	77	25	50.2	2.29	T.
Rawlins	79[1]	34[1]	57.0[1]	0.08	
Riverton	86	35	59.2	1.21	
Saratoga	79	32	55.7	0.33	
Sheridan	83	36	58.0	1.30	
Shoshone Canyon	82	36	56.8	2.01	
South Pass City	70	17	43.8	0.70	
Ten Sleep				0.89	
Wells	69	21	45.2	2.68	2.0
Wolf	81	36	58.5	0.80	
Wyncote	88	38	62.0	4.17	
Yellowstone Pk. (Fount.)	68	24	44.8	4.74	
Yellowstone Pk. (G. Can.)	66	25	43.8	4.21	2.8
Yellowstone Pk. (Lake)	67	25	44.6	3.06	
Yellowstone Pk. (Norris)	70	27	48.0	3.40	
Yellowstone Pk. (Riv'side)	79	22	46.3	2.57	
Yellowstone Pk. (S. River)				3.73	T.
Yellowstone Pk. (Soda B.)	70	20	46.0	2.59	
Yellowstone Pk. (T. Sta.)	71	21	44.4	0.75	6.0
Yellowstone Pk. (Up. Ba.)	72[1]	25[1]	44.4[1]	3.71	
Porto Rico.					
Adjuntas	86	61	72.4		
Aguirre	94	65	81.3	3.22	
Albonito	87	49	73.2	2.40	
Alto de La Bandera	83*	66	74.2[b]	6.88	
Anasco	94	64	78.8	8.58	
Arecibo	91	60	74.8	5.31	
Barros	91	62	75.8	1.86	
Porto Rico—Cont'd.					
Bayamon	90	65	76.8	3.65	
Caguas	96	62	78.2	4.02	
Canovanas	92	70	78.8	9.10	
Cayey	88	51	73.5	2.07	
Cidra	90	63	76.2	5.16	
Corozal	92	64	79.2	2.56	
Fajardo	92	70	81.4	4.36	
Guanica	95	66	80.3	4.90	
Guayama				4.65	
Hacienda Colosa	92	63	78.1	10.86	
Humacao	95	68	79.2	6.86	
Isabela	92	68	80.0	1.25	
Isolina	89	62	75.0	4.51	
La Carmelita	88	62	74.4	10.21	
Lares	92	60	76.0	8.40	
Las Marias	90[a]	60*	75.6[k]	2.75	
Manati	96	67	79.7	3.84	
Maricao	86	60	72.7	6.14	
Maunabo	92	70	81.6	7.22	
Mayaguez	94	64	78.6	4.16	
Ponce	94	70	80.6	2.15	
Rio Blanco	89	66	78.0	12.32	
Rio Piedras				8.15	
San German	93	65	80.0	1.10	
San Lorenzo	91	61	76.0	7.03	
San Salvador	89	60	73.4	3.57	
Santa Isabel	93[4]	69[4]	80.4[4]	2.04	
Vieques	93*	69	80.4*	6.77	
Yabucoa				6.90	
Yauco	94	65	79.6	0.81	
New Brunswick.					
St. John	76	36	53.8	1.43	

Late reports for May, 1907.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.					
Maple Grove	89	41	66.2	7.28	
Alaska.					
Circle	75	19	47.7	0.29	0.2
Coal Harbor	55	25	40.8	4.59	
Fort Gibbon	78	17	48.0	0.30	
Fort Liscum	70	25	44.6	4.05	
Gulkana	92	29	52.9		
Holy Cross Mission	76	20	44.2		
Katalla	68	31	45.6	4.85	
Kenai	72	23	44.7	1.24	
Ketchemstock	76	20	45.2	1.30	12.0
Loring	74	28	50.3	4.30	
Nome	49	15	34.3	1.12	
Rampart	79	19	46.8	0.44	
Sunrise	71	25	45.3	1.30	
Udakta	48	26	39.4	5.39	
Wood Island	67	31	45.5	6.30	
Arizona.					
Benson	93	40	65.1	0.33	
Silverbell	96	49	72.8	1.11	
Tombstone	88	42	64.6	1.60	
Arkansas.					
Brinkley	90	43	65.9	12.03	
California.					
Towle	82	32	53.2	1.76	
Colorado.					
Gunnison	77	12	42.3	1.18	T.
Connecticut.					
Falls Village				4.04	0.5
New London	79	33	52.2	4.05	
Florida.					
Jasper	92	52	74.8	1.97	
Idaho.					
Kellogg	81	27	51 6	1.30	
Illinois.					
Decatur	89	29	56.8	2.89	
Dixon	84	25	51.8	4.89	
Galva	84	27	54.0	2.83	T.
Hillsboro	87	30	57.3	7.00	
McLeansboro	86	34	59.2	3.61	
Martinton	83	28	55.0	2.86	T.
Olney	87	32	59.3	6.38	
Rantoul	86	28	55.8	3.08	T.
Rockford	81	28	52.4	2.96	T.
Sycamore	84	24	51.6	4.59	T.
Tuscola	87	28	57.0	2.76	
Indiana.					
Plymouth	80	27	53.8	2.74	
Indian Territory.					
Chickasha	93	34	65.0	5.12	
Iowa.					
Guthrie Center	87	19	54.9	3.25	0.7
Kansas.					
Pratt				1.75	0.5
Louisiana.					
Georgetown	92	46	70.6		
Massachusetts.					
Holyoke	90	31	52.3	3.84	T.
Minnesota.					
Milaca	81[4]	16*	44.6*	2.92	

TABLE II.—*Climatological record of cooperative observers*—Continued. *Late reports for May, 1907*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Nebraska.	°	°	°	*Ins.*	*Ins*
Atkinson	89	25	50.7	3.78	0.5
Auburn	94	22	54.9	1.46	3.0
Columbus	90	25	53.6	2.13	0.2
Fairbury	94	25	57.4	1.89	4.0
Fairmont	95	22	54.2	2.45	3.0
Grand Island	95	25	57.2	4.12	5.0
Hartington	94	19	51.0	3.36	
Harvard	92	22	53.6	2.40	5.0
New Mexico.					
Estancia	80	20	51.2	1.22	
New York.					
Dannemora	79	21	46.6	2.93	T.
North Carolina.					
Caroleen	90	42	68.5	5.19	
Horse Cove	79	42	61.1	6.36	
Oklahoma.					
Norman	88[b]	35[d]	63.6[e]	7.14	
Temple	97	34	68.1	7.80	
Oregon.					
Hermiston				0.74	
South Dakota.					
Ashcroft	76	17	46.4	4.21	2.0
Milbank	77	15	45.6	3.83	11.6
Tennessee.					
Bristol	86	34	61.8	1.95	
Decatur	90	40	65.4	4.79	
Springdale	89	33	63.6	5.59	
Texas.					
Big Spring	96	31	69.8	1.97	
Hereford	90	31	62.6	1.75	
Ochiltree				1.02	
Santa Gertrude				0.00	
Sugarland	91	48	71.7	19.34	
Utah.					
Loa	75	19	43.6	0.26	
Morgan	85	26	51.2	3.08	
Tropic	79	27	49.9	1.33	T.
Wisconsin.					
Burnett	81	25	50.6	2.59	T.
New London	82	26	49.0	2.98	1.0
Wyoming.					
Daniel	67	14	41.6	0.89	2.0
Lolabama Ranch	64	12	40.3	1.59	3.0
Porto Rico.					
Alto de la Bandera	83[b]	60[b]	71.8[b]	5.71	

EXPLANATION OF SIGNS.

• Extremes of temperature from observed readings of dry thermometer.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. ÷ 4.
[2] Mean of 8 a. m. + 8 p. m. ÷ 2.
[3] Mean of 7 a. m. + 7 p. m. ÷ 2.
[4] Mean of 6 a. m. + 6 p. m. ÷ 2.
[5] Mean of 7 a. m. + 2 p. m. ÷ 2.
[6] Mean of readings at various hours reduced to true daily mean by special tables.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "n" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks of whatever duration, in the precipitation record receive appropriate notice.

CORRECTIONS.

March, 1907.

New Mexico, San Rafael, make mean 47.4.

May, 1907.

Illinois, Ottawa, make mean 55.8. Ohio, Cadiz, make 55.2.

Alaska, under late reports for April, 1907, make Forbnam read Loring.

TABLE III.—*Wind resultants, from observations at 8 a. m. and 8 p. m., daily, during the month of June, 1907.*

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	16	30	14	11	s. 12 e.	14
Portland, Me	14	24	16	22	s. 31 w.	12
Concord, N. H.†	13	9	11	6	n. 51 e.	6
Burlington, Vt.†	5	18	4	6	s. 9 w.	13
Northfield, Vt	24	27	11	10	s. 18 e.	3
Boston, Mass	9	25	15	25	s. 32 w.	19
Nantucket, Mass	13	29	11	24	s. 39 w.	21
Block Island, R. I	9	28	10	28	s. 43 w.	26
Providence, R. I	13	22	18	24	s. 34 w.	11
Hartford, Conn	17	28	8	16	s. 56 w.	14
New Haven, Conn	16	26	12	22	s. 45 w.	14
Middle Atlantic States.						
Albany, N. Y	14	30	12	14	s. 7 w.	16
Binghamton, N. Y.†	8	5	16	7	n. 72 e.	10
New York, N. Y	16	25	13	19	s. 34 w.	11
Harrisburg, Pa	14	16	22	18	s. 63 e.	4
Philadelphia, Pa	16	19	19	20	s. 18 w.	3
Scranton, Pa	22	21	15	17	n. 63 w.	2
Atlantic City, N. J	12	21	21	18	s. 18 e.	10
Cape May, N. J	14	21	24	13	s. 58 e.	13
Baltimore, Md	22	12	18	21	n. 17 w.	10
Washington, D. C	19	18	20	15	n. 79 e.	5
Lynchburg, Va	21	12	25	19	n. 34 e.	11
Mount Weather, Va	19	20	18	19	s. 45 w.	1
Norfolk, Va	17	28	16	12	s. 20 e.	12
Richmond, Va	27	21	13	12	n. 9 e.	6
Wytheville, Va	11	8	22	28	n. 63 w.	7
South Atlantic States.						
Asheville, N. C	24	21	17	14	n. 45 e.	4
Charlotte, N. C	18	20	17	16	s. 27 e.	2
Hatteras, N. C	12	23	18	23	s. 21 w.	12
Raleigh, N. C	20	17	14	20	n. 63 w.	7
Wilmington, N. C	16	21	16	20	s. 39 w.	6
Charleston, S. C	13	24	12	21	s. 39 w.	14
Columbia, S. C	14	23	17	20	s. 18 w.	10
Augusta, Ga	12	27	11	23	s. 39 w.	19
Savannah, Ga	10	25	8	29	s. 55 w.	26
Jacksonville, Fla	11	21	17	22	s. 27 w.	11
Florida Peninsula.						
Jupiter, Fla	9	24	20	18	s. 8 e.	15
Key West, Fla	15	17	34	9	s. 85 e.	25
Tampa, Fla	13	9	23	25	n. 27 w.	4
Eastern Gulf States.						
Atlanta, Ga	17	13	12	29	n. 77 w.	18
Macon, Ga.†	9	10	1	15	s. 86 w.	14
Thomasville, Ga	9	27	13	22	s. 27 w.	20
Pensacola, Fla.†	12	7	9	12	n. 31 w.	6
Anniston, Ala	15	25	12	19	s. 35 w.	12
Birmingham, Ala	13	23	12	26	s. 54 w.	17
Mobile, Ala	15	31	5	18	s. 39 w.	21
Montgomery, Ala	13	18	13	28	s. 72 w.	16
Meridian, Miss	11	26	16	26	s. 34 w.	18
Vicksburg, Miss	10	33	13	18	s. 12 w.	24
New Orleans, La	10	30	13	17	s. 11 w.	20
Western Gulf States.						
Shreveport, La	7	33	23	11	s. 25 e.	29
Bentonville, Ark.†	3	18	9	5	s. 15 e.	16
Fort Smith, Ark	10	23	27	10	s. 52 e.	22
Little Rock, Ark	17	27	10	18	s. 39 w.	13
Corpus Christi, Tex	1	40	32	2	s. 38 e.	49
Fort Worth, Tex	2	39	21	10	s. 16 e.	39
Galveston, Tex	3	41	27	6	s. 29 e.	43
Palestine, Tex	4	44	12	10	s. 3 e.	40
San Antonio, Tex	3	38	38	2	s. 46 e.	50
Taylor, Tex.†	0	23	7	3	s. 10 e.	23
Ohio Valley and Tennessee.						
Chattanooga, Tenn	16	16	13	29	w.	16
Knoxville, Tenn	17	21	16	24	s. 63 w.	9
Memphis, Tenn	18	25	14	19	s. 36 w.	9
Nashville, Tenn	14	21	14	27	s. 62 w.	15
Lexington, Ky.†	4	13	9	10	s. 6 w.	9
Louisville, Ky	17	27	17	13	s. 22 e.	11
Evansville, Ind.†	12	9	9	5	n. 53 e.	5
Indianapolis, Ind	19	21	20	14	s. 72 e.	6
Cincinnati, Ohio	17	17	22	21	e.	1
Columbus, Ohio	18	20	22	16	s. 72 e.	6
Pittsburg, Pa	25	15	17	19	n. 11 w.	10
Parkersburg, W. Va	20	19	17	19	n. 63 w.	2
Elkins, W. Va	19	21	11	20	s. 77 w.	9
Lower Lake Region.						
Buffalo, N. Y	5	26	17	24	s. 18 w.	22
Canton, N. Y.†	5	12	6	14	s. 49 w.	11
Oswego, N. Y	10	23	9	27	s. 54 w.	22
Rochester, N. Y	12	24	15	28	s. 47 w.	18
Syracuse, N. Y	10	22	12	27	s. 51 w.	19
Erie, Pa	9	20	18	23	s. 24 w.	12
Cleveland, Ohio	15	18	23	16	s. 67 e.	8
Sandusky, Ohio†	7	10	11	9	s. 34 e.	4
Toledo, Ohio	17	19	17	21	s. 63 w.	4
Detroit, Mich	17	18	20	16	s. 76 e.	4
Upper Lake Region.						
Alpena, Mich	12	24	22	18	s. 18 e.	13
Escanaba, Mich	14	29	18	10	s. 28 e.	17
Grand Haven, Mich	12	25	13	21	s. 32 w.	15
Grand Rapids, Mich	17	19	18	20	s. 45 w.	3
Houghton, Mich.†	3	5	18	10	s. 76 e.	8
Marquette, Mich	20	20	20	15	e.	5
Port Huron, Mich	20	24	18	16	s. 27 e.	4
Sault Ste. Marie, Mich	8	19	17	26	s. 39 w.	14
Chicago, Ill	18	20	19	16	s. 56 e.	4
Milwaukee, Wis	17	19	16	18	s. 45 w.	3
Green Bay, Wis	14	26	17	18	s. 5 w.	12
Duluth, Minn	26	9	25	21	n. 13 e.	18

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
North Dakota.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Moorhead, Minn	17	25	16	15	s. 7 e.	8
Bismarck, N. Dak	21	17	17	20	n. 37 w.	5
Devils Lake, N. Dak	15	21	21	19	s. 18 e.	6
Williston, N. Dak	22	15	21	18	n. 23 e.	8
Upper Mississippi Valley.						
Minneapolis, Minn.*	3	10	8	12	s. 30 w.	8
St. Paul, Minn	17	20	21	16	s. 59 e.	6
La Crosse, Wis.†	7	17	5	6	s. 6 w.	10
Madison, Wis	16	26	15	19	s. 22 w.	11
Charles City, Iowa	18	21	21	17	s. 53 e.	5
Davenport, Iowa	16	17	17	21	s. 76 w.	4
Des Moines, Iowa	17	26	15	15	s.	9
Dubuque, Iowa	21	21	13	20	w.	7
Keokuk, Iowa	18	19	17	21	s. 76 w.	4
Cairo, Ill	21	23	16	16	s.	2
La Salle, Ill.†	5	10	10	11	s. 11 w.	5
Peoria, Ill	16	25	16	18	s. 13 w.	9
Springfield, Ill	15	25	16	18	s. 11 w.	10
Hannibal, Mo.†	10	10	6	11	w.	5
St. Louis, Mo	9	28	17	16	s. 3 e.	19
Missouri Valley.						
Columbia, Mo.*	8	13	9	7	s. 22 e.	5
Kansas City, Mo	14	31	22	10	s. 35 e.	21
Springfield, Mo	12	31	20	13	s. 20 e.	20
Iola, Kans.†	5	16	10	3	s. 32 e.	13
Topeka, Kans.*	7	14	12	2	s. 55 e.	12
Lincoln, Nebr	22	22	23	7	e.	16
Omaha, Nebr	22	21	17	11	n. 80 e.	6
Valentine, Nebr	22	18	19	14	n. 51 e.	6
Sioux City, Iowa†	9	13	9	6	s. 57 e.	5
Pierre, S. Dak	14	18	31	13	s. 77 e.	18
Huron, S. Dak	17	25	19	11	s. 45 e.	11
Yankton, S. Dak.†	8	11	11	9	s. 34 e.	4
Northern Slope.						
Havre, Mont	18	14	12	30	n. 77 w.	18
Miles City, Mont	27	11	20	17	n. 11 e.	16
Helena, Mont	12	20	6	35	s. 75 w.	30
Kalispell, Mont	4	21	10	31	s. 51 w.	27
Rapid City, S. Dak	18	16	17	24	n. 74 w.	7
Cheyenne, Wyo	25	21	9	23	n. 74 w.	15
Lander, Wyo	13	18	9	37	s. 80 w.	28
Sheridan	20	18	14	23	n. 77 w.	9
Yellowstone Park, Wyo	12	34	6	20	s. 32 w.	26
North Platte, Nebr	17	25	21	14	s. 41 e.	11
Middle Slope.						
Denver, Colo	17	29	11	12	s. 5 w.	12
Pueblo, Colo	17	19	18	24	s. 72 w.	6
Concordia, Kans	14	26	19	13	s. 27 e.	13
Dodge, Kans	13	27	28	8	s. 55 e.	24
Wichita, Kans	13	32	20	10	s. 28 e.	22
Oklahoma, Okla	8	40	13	6	s. 12 e.	35
Southern Slope.						
Abilene, Tex	8	37	22	4	s. 32 e.	34
Amarillo, Tex	10	28	25	8	s. 43 e.	25
Del Rio, Tex†	2	15	22	0	s. 60 e.	26
Roswell, N. Mex.	20	12	15	23	n. 45 w.	11
Southern Plateau.						
El Paso, Tex	18	6	11	38	n. 66 w.	30
Santa Fe, N. Mex	19	15	24	18	n. 56 e.	7
Flagstaff, Ariz	15	20	8	31	s. 78 w.	24
Phoenix, Ariz	13	11	25	23	n. 45 e.	3
Yuma, Ariz	10	24	7	30	s. 59 w.	27
Independence, Cal	22	10	11	33	n. 61 w.	25
Middle Plateau.						
Reno, Nev	6	10	8	45	s. 84 w.	37
Tonopah, Nev	17	14	12	30	n. 81 w.	18
Winnemucca, Nev	22	16	14	26	n. 63 w.	13
Modena, Utah	8	15	6	40	s. 78 w.	35
Salt Lake City, Utah	15	18	26	16	s. 73 e.	10
Durango, Colo	29	9	4	39	n. 60 w.	40
Grand Junction, Colo	15	18	24	18	s. 63 e.	7
Northern Plateau.						
Baker City, Oreg	24	22	9	19	n. 79 w.	10
Boise, Idaho	20	17	17	22	n. 59 w.	6
Lewiston, Idaho†	2	4	21	5	s. 83 e.	16
Pocatello, Idaho	2	28	19	25	s. 13 w.	27
Spokane, Wash	12	30	8	20	s. 34 w.	22
Walla Walla, Wash						
North Pacific Coast Region.						
North Head, Wash	28	13	5	35	n. 63 w.	34
Port Crescent, Wash.*	4	6	0	26	s. 86 w.	26
Seattle, Wash	18	20	17	16	s. 27 e.	2
Tacoma, Wash	26	18	3	27	n. 72 w.	25
Tatoosh Island, Wash	3	27	4	38	s. 55 w.	42
Portland, Oreg	23	20	8	23	n. 79 w.	15
Roseburg, Oreg	30	9	5	25	n. 44 w.	29
Middle Pacific Coast Region.						
Eureka, Cal	29	13	5	27	n. 54 w.	27
Mount Tamalpais, Cal	20	4	1	46	n. 70 w.	48
Red Bluff, Cal	17	27	20	13	s. 35 e.	12
Sacramento, Cal	7	42	11	13	s. 3 w.	35
San Francisco, Cal	4	13	0	51	s. 80 w.	52
San Jose, Cal.†						
Southeast Farallon, Cal.*	16	4	0	21	n. 60 w.	24
South Pacific Coast Region.						
Fresno, Cal	37	4	4	37	n. 45 w.	47
Los Angeles, Cal	10	21	11	33	s. 63 w.	25
San Diego, Cal	23	14	6	31	n. 70 w.	27
San Luis Obispo, Cal	29	6	3	34	n. 54 w.	39
West Indies						
San Juan, Porto Rico	1	17	50	1	s. 72 e.	52
Grand Turk, W.I.†	0	16	21	0	s. 37 e.	26

* From observations at 8 p. m. only. † From observations at 8 a. m. only.

TABLE IV.—*Accumulated amounts of precipitation for each 5 minutes, for storms in which the rate of fall equaled or exceeded 0.25 in any 5 minutes, or 0.80 in 1 hour, during June, 1907, at all stations furnished with self-registering gages.*

Stations.	Date.	Total duration. From—	Total duration. To—	Total amount of precipitation.	Excessive rate. Began—	Excessive rate. Ended—	Amount before excessive began.	Depths of precipitation (in inches) during periods of time indicated. 5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
Abilene, Tex	20			0.47									0.38								
Albany, N. Y	26	2:05 p. m.	2:50 p. m.	0.82	2:10 p. m.	2:39 p. m.	0.01	0.13	0.33	0.53	0.70	0.76									
Alpena, Mich	20	10:07 p. m.	10:25 p. m.	0.48	10:07 p. m.	10:25 p. m.	0.00	0.18	0.31	0.47	0.48										
Amarillo, Tex	17–18			1.36														0.96			
Anniston, Ala	13–14			0.88									0.36								
Asheville, N. C	28	10:45 a. m.	1:45 p. m.	0.83	12:12 p. m.	12:41 p. m.	0.09	0.14	0.18	0.23	0.29	0.49	0.61								
Atlanta, Ga	13			0.55									0.39								
Atlantic City, N. J	29			1.32														0.44			
Augusta, Ga	27–28			2.05														0.72			
Baltimore, Md	5	1:30 p. m.	2:15 p. m.	0.47	1:39 p. m.	1:50 p. m.	0.01	0.26	0.37												
Bentonville, Ark	25	5:35 a. m.	6:10 a. m.	1.06	5:40 a. m.	6:00 a. m.	0.02	0.56	0.86	0.98	1.01										
Do	26	3:40 a. m.	7:10 a. m.	3.31	4:00 a. m. 4:50 a. m.	4:50 a. m. 6:18 a. m.	0.03	0.06 1.53	0.41 1.73	0.58 2.09	0.75 2.23	0.87 2.29	0.92 2.32	0.98 2.38	1.12 2.39	1.32 2.39	1.33 2.41	2.59	3.14	3.27	
Binghamton, N. Y	5			0.32									0.27								
Birmingham, Ala	13	9:27 a. m.	11:05 a. m.	0.70	9:34 a. m.	10:04 a. m.	0.01	0.12	0.26	0.32	0.39	0.47	0.58								
Bismarck, N. Dak	20	12:30 a. m.	5:15 a. m.	0.96	12:50 a. m.	1:19 a. m.	0.08	0.18	0.26	0.47	0.55	0.63	0.74								
Block Island, R. I	29–30			0.70														0.50			
Boise, Idaho	10			0.13					0.10												
Boston, Mass	29–30			1.05														0.56			
Buffalo, N. Y	4–5			0.86									0.18								
Cairo, Ill	24			0.95														0.60			
Canton, N. Y	19			0.43					0.34												
Charles City, Iowa	30	10:08 a. m. 2:30 p. m.	10:55 a. m. 5:50 p. m.	1.02 1.22	10:08 a. m. 4:11 p. m.	10:27 a. m. 4:26 p. m.	0.00 0.09	0.30 0.28	0.55 0.59	0.82 0.85	0.99	1.02									
Charleston, S. C	28–29	9:02 p. m.	10:55 a. m.	3.36	6:49 a. m. 9:18 a. m.	7:10 a. m. 10.00 a. m.	1.16 2.30	0.13 0.15	0.38 0.16	0.47 0.25	0.56 0.46	0.62 0.56	0.70	0.73	0.80						
Charlotte, N. C	23	1:05 p. m.	2:45 p. m.	0.74	1:06 p. m.	1:26 p. m.	T.	0.40	0.53	0.62	0.67										
Chattanooga, Tenn	8	2:47 a. m.	10:45 a. m.	2.58	3:56 a. m. 9:15 a. m.	4:36 a. m. 9:40 a. m.	0.12 1.99	0.12 0.16	0.20 0.36	0.25 0.39	0.31 0.49	0.42 0.59	0.37	0.70	0.79						
Cheyenne, Wyo	20			0.06					0.04												
Chicago, Ill	4–5			1.19														0.40			
Cincinnati, Ohio	22			1.04							1.00*										
Cleveland, Ohio	24	2:20 p. m.	3:12 p. m.	0.50	2:51 p. m.	3:01 p. m.	0.12	0.26	0.37												
Do	25	7:18 p. m.	8:05 p. m.	0.51	7:36 p. m.	7:56 p. m.	0.03	0.11	0.25	0.39	0.47										
Columbia, Mo	25			0.87					0.34												
Columbia, S. C	13	4:50 p. m.	7:46 p. m.	0.97	5:49 p. m.	6:07 p. m.	0.13	0.21	0.36	0.47	0.53										
Columbus, Ohio	12			0.58									0.34								
Concord, N. H	29–30			1.13														0.50			
Corpus Christi, Tex	26			T.				T.													
Davenport, Iowa	23	2:30 a. m.	5:20 a. m.	0.69	4:18 a. m.	4:33 a. m.	0.13	0.19	0.34	0.47											
Del Rio, Tex	12	10:35 p. m.	11:30 p. m.	0.74	10:40 p. m.	11:03 p. m.	0.03	0.23	0.38	0.43	0.55	0.63									
Denver, Colo	2	3:15 p. m.	5:30 p. m.	0.83	4:39 p. m.	4:53 p. m.	0.26	0.40	0.47	0.51											
Des Moines, Iowa	23			0.60					0.35												
Detroit, Mich	26			0.36									0.31								
Dodge, Kans	17	4:05 p. m.	6:35 p. m.	1.16	5:28 p. m.	5:55 p. m.	0.33	0.07	0.19	0.45	0.66	0.74	0.77								
Dubuque, Iowa	23			0.38														0.31			
Duluth, Minn	10			1.03									0.11								
Eastport, Me	30			0.44									0.20								
Elkins, W. Va	23	1:25 p. m.	4:30 p. m.	1.81	1:34 p. m.	2:11 p. m.	0.01	0.43	0.81	1.03	1.37	1.51	1.56	1.61	1.65						
Erie, Pa	24			0.49									0.25								
Escanaba, Mich	17			0.89						0.27											
Evansville, Ind	12			0.47					0.33												
Fort Smith, Ark	9	9:18 p. m	10:27 p. m.	0.83	9:21 p. m.	9:49 p. m.	0.01	0.21	0.43	0.48	0.51	0.72	0.80								
Do	30	4:08 a. m.	5:22 a. m.	1.71	4:10 a. m.	5:14 a. m.	0.01	0.22	0.54	0.79	0.92	1.00	1.10	1.29	1.43	1.46	1.52	1.61	1.70		
Fort Worth, Tex	5	9:28 a. m.	10:38 a. m.	1.20	9:46 a. m.	10:11 a. m.	0.01	0.11	0.44	0.83	1.04	1.12									
Galveston, Tex	17			T.														T.			
Grand Haven, Mich	23–24			0.92														0.61			
Grand Rapids, Mich	22–23			0.77									0.34								
Green Bay, Wis	30			1.11														0.52			
Hannibal, Mo	30			0.98									0.81								
Harrisburg, Pa	29			1.50						0.24											
Hartford, Conn	5			0.71									0.17								
Hatteras, N. C	8	7:05 a. m.	9:25 a. m.	1.03	8:01 a. m.	8:35 a. m.	0.12	0.13	0.15	0.22	0.32	0.46	0.65	0.81							
Do	18	11:10 a. m.	4:05 p. m.	2.67	2:35 p. m.	3:30 p. m.	1.10	0.08	0.19	0.23	0.26	0.37	0.54	0.70	0.98	1.17	1.38	1.49			
Huron, S. Dak	9–10			1.64									0.29								
Indianapolis, Ind	25	6:04 p. m.	7:53 p. m.	0.75	6:23 p. m.	6:43 p. m.	0.01	0.19	0.38	0.58	0.64										
Iola, Kans	29–30	11:35 p. m.	12:20 a. m.	0.68	11:45 p. m.	12:00 mid.	0.04	0.14	0.45	0.60											
Jacksonville, Fla	13	12:26 p. m.	1:15 p. m.	0.88	12:47 p. m.	1:04 p. m.	0.01	0.18	0.43	0.75	0.87										
Jupiter, Fla	11	7:27 p. m.	9:30 p. m.	0.78	7:48 p. m.	8:13 p. m.	0.02	0.11	0.23	0.33	0.54	0.63									
Do	19	2:12 p. m.	8:00 p. m.	0.76	6:42 p. m.	6:57 p. m.	0.08	0.28	0.39	0.62											
Kansas City, Mo	20	6:20 p. m.	7:05 p. m.	0.66	6:39 p. m.	6:50 p. m.	0.05	0.24	0.59	0.61											
Do	24–25	11:30 p. m.	D. N.	0.97	11:36 p. m.	12:06 a. m.	0.01	0.08	0.13	0.23	0.34	0.50	0.61								
Keokuk	9	7:20 p. m.	11:20 p. m.	1.44	7:20 p. m.	7:49 p. m.	0.00	0.10	0.34	0.62	0.86	0.96	1.02								
Do	30	8:35 p. m.	11:00 p. m.	0.70	8:38 p. m.	8:55 p. m.	0.00	0.26	0.47	0.54											
Key West, Fla	16	1:00 a. m.	2:50 a. m.	1.25	1:05 a. m.	1:31 a. m.	0.01	0.13	0.29	0.53	0.93	1.14	1.19								
Knoxville, Tenn	9	3:00 p. m.	4:10 p. m.	1.12	3:04 p. m.	3:29 p. m.	0.01	0.19	0.58	0.82	1.04										
La Crosse, Wis	21–22			0.68									0.31								
La Salle, Ill	18	8:12 p. m.	10:00 p. m.	0.87	8:13 p. m.	8:43 p. m.	T.	0.20	0.30	0.41	0.47	0.52	0.57								
Lexington, Ky	29	12:40 p. m.	2:55 p. m.	0.53	2:41 p. m.	2:49 p. m.	0.12	0.31	0.40												
Lincoln, Nebr	22	8:40 p. m.	10:10 p. m.	0.53	8:46 p. m.	8:58 p. m.	0.01	0.14	0.34	0.39											
Do	24	7:25 p. m.	10:25 p. m.	1.32	7:32 p. m.	7:57 p. m.	0.01	0.19	0.45	0.77	0.87	0.93									
Little Rock, Ark	12	5:56 p. m.	9:40 p. m.	0.44	6:07 p. m.	6:15 p. m.	0.01	0.24	0.32												
Los Angeles, Cal	12			0.02									0.02								
Louisville, Ky	7–8			0.50														0.39			
Lynchburg, Va	23	4:10 p. m.	8:15 p. m.	1.02	4:30 p. m.	5:03 p. m.	T.	0.32	0.63	0.85	0.91	0.93									
Macon, Ga	24	9:20 p. m.	D. N.	0.82	9:43 p. m.	10:07 p. m.	0.02	0.08	0.22	0.36	0.51	0.63									
Madison, Wis	23			0.41									0.26								
Marquette, Mich	23	4:25 p. m.	8:15 p. m.	3.95	4:32 p. m.	5:52 p. m.	T.	0.29	0.53	0.59	0.75*	1.02*	1.35*	1.70*	1.91*	2.17*	2.42*	2.93*	3.54*		
Memphis, Tenn	24–25			0.72									0.42								
Meridian, Miss	5			0.38						0.32											
Milwaukee, Wis	21			0.57						0.53											
Minneapolis, Minn	21			0.80									0.23								
Mobile, Ala	5			0.37					0.34												
Montgomery, Ala	23	2:13 p. m.	4:10 p. m.	1.52	2:51 p. m.	3:36 p. m.	0.11	0.23	0.60	0.86	1.03	1.08	1.16	1.25	1.31	1.37					
Mount Weather, Va	13			0.61									0.20								
Nantucket, Mass	2–3	8:03 a. m.	2:25 p. m.	1.47	4:38 a. m.	5:03 a. m.	0.38	0.09	0.24	0.40	0.47	0.52									
Nashville, Tenn	8			1.07					0.49												
New Haven, Conn	29–30			0.95									0.27								
New Orleans, La	25			0.27						0.27											
New York, N. Y	29–30			1.01									0.19								
Norfolk, Va	5			0.23						0.18											

TABLE IV.—*Accumulated amounts of precipitation for each 5 minutes, etc.*—Continued.

Stations.	Date.	Total duration. From—	Total duration. To—	Total amount of precipitation.	Excessive rate. Began—	Excessive rate. Ended—	Amount before excessive began.	Depths of precipitation (in inches) during periods of time indicated. 5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
Northfield, Vt.	19			1.40														0.69			
North Head, Wash.	10–11			0.77														0.17			
Oklahoma, Okla.	9	6:50 a. m.	11:23 a. m.	2.13	7:23 a. m.	8:13 a. m.	0.16	0.06	0.15	0.18	0.25	0.41	0.51	0.61	0.75	0.85	0.94				
Do	26–27	10:05 p. m.	9:48 a. m.	2.62	3:57 a. m.	4:37 a. m.	0.45	0.06	0.12	0.17	0.23	0.43	0.67	0.84	0.93						
Omaha, Nebr.	21	4:55 p. m.	7:02 p. m.	0.77	5:30 p. m.	6:10 p. m.	0.02	0.17	0.20	0.23	0.30	0.38	0.40	0.63	0.74						
Palestine, Tex.	29			0.50									0.40								
Parkersburg, W. Va.	20	2:55 p. m.	3:06 p. m.	0.44	2:58 p. m.	3:10 p. m.	0.01	0.21	0.41	0.43											
Pensacola, Fla.	14			0.41									0.30								
Peoria, Ill.	24	9:02 a. m.	11:15 a. m.	1.53	9:25 a. m.	9:58 a. m.	0.02	0.06	0.10	0.24	0.68	1.06	1.30	1.42							
Philadelphia, Pa.	5			0.75									0.34								
Pittsburg, Pa.	12–13			1.22									0.24								
Portland, Me.	29–30			1.36									0.32								
Portland, Oreg.	12			0.22					0.13												
Pueblo, Colo.	30			0.39						0.18											
Raleigh, N. C.	1	7:15 p. m.	8:15 p. m.	0.85	7:18 p. m.	7:35 p. m.	0.01	0.18	0.37	0.72	0.80										
Do	3	7:59 p. m.	D. N.	2.63	8:34 p. m.	9:42 p. m.	0.12	0.16	0.19	0.26	0.46	0.55	0.70	0.81	1.03	1.51	1.66	2.12	2.42		
Richmond, Va.	28–29	12:37 p. m.	D. N.	2.27	6:45 p. m.	8:08 p. m.	0.32	0.08	0.17	0.30	0.42	0.49	0.60	0.72	0.78	0.83	0.88	0.97	1.29	1.39	
Rochester, N. Y.	5			0.21					0.05												
Sacramento, Cal.	13			0.53									0.10								
St. Louis, Mo.	22	2:06 p. m.	3:20 p. m.	0.90	2:10 p. m.	2:45 p. m.	T.	0.18	0.38	0.48	0.54	0.67	0.78	0.87							
St. Paul, Minn.	29			0.53					0.31												
Salt Lake City, Utah	22			0.38														0.26			
San Antonio, Tex.	20			0.13									0.05								
San Diego, Cal.	12			0.11						0.04											
Sandusky, Ohio	23			0.57														0.53			
San Francisco, Cal.	12–13			0.74														0.35			
Savannah, Ga.	28–29	6:13 p. m.	8:50 a. m.	5.38	5:18 a. m. 7:03 a. m.	6:30 a. m. 8:06 a. m.	1.68 2.93	0.05 0.26	0.10 0.30	0.14 0.36	0.24 0.49	0.37 0.82	0.48 1.02	0.55 1.18	0.62 1.29	0.66 1.51	0.74 1.72	0.85 2.06	1.15 2.25		
Scranton, Pa.	26			0.13					0.11												
Seattle, Wash.	28			0.26									0.08								
Shreveport, La.	28			0.47							0.44										
Spokane, Wash.	21–22			0.45									0.21								
Springfield, Ill.	23			0.38					0.32												
Springfield, Mo.	7	10:10 p. m.	11:20 p. m.	0.98	10:30 p. m.	10:57 p. m.	0.07	0.23	0.34	0.56	0.36	0.39	0.40	0.56	0.83	0.97					
Do	8	2:00 a. m.	5:30 a. m.	1.48	3:44 a. m.	4:40 a. m.	0.01	0.21	0.29	0.33	0.36	0.39	0.48	0.63	0.77	0.83	0.92				
Do	25	4:40 a. m.	7:15 a. m.	1.29	4:45 a. m.	5:20 a. m.	0.01	0.23	0.42	0.56	0.63	0.68	0.72	0.80							
Syracuse, N. Y.	29–30			2.15														0.33			
Tampa, Fla.	25	1:00 p. m.	1:55 p. m.	1.12	1:15 p. m.	1:45 p. m.	0.10	0.22	0.53	0.71	0.84	0.93	1.00								
Do	30	1:55 p. m.	3:30 p. m.	1.45	2:00 p. m.	2:48 p. m.	0.01	0.05	0.18	0.39	0.69	0.96	1.20	1.26	1.27	1.33	1.40				
Taylor, Tex.	20			0.56														0.14			
Thomasville, Ga.	28	7:01 a. m.	8:30 a. m.	0.77	7:02 a. m.	7:22 a. m.	0.01	0.14	0.47	0.57											
Toledo, Ohio	10			0.59					0.34												
Topeka, Kans.	29	8:40 p. m.	10:45 p. m.	1.32	8:42 p. m.	9:42 p. m.	0.01	0.18	0.31	0.34	0.40	0.48	0.57	0.61	0.68	0.84	0.95	1.05			
Valentine, Nebr.	13			1.62														*			
Vicksburg, Miss.	11	8:10 a. m.	1:50 p. m.	2.20	9:51 a. m.	10:31 a. m.	0.16	0.06	0.22	0.44	0.59	0.89	1.13	1.25	1.42						
Washington, D. C.	1			2.20														0.44			
Wichita, Kans.	22	D. N.	5:12 a. m.	0.77	3:50 a. m.	4:14 a. m.	0.14	0.19	0.31	0.38	0.44	0.48									
Wilmington, N. C.	11	D. N.	D. N.	1.12	2:39 a. m	3:06 a. m.	0.01	0.21	0.54	0.68	0.78	0.85									
Do	28–29	5:15 p. m.	1:50 p. m.	3.58	8:58 a. m. 9:48 a. m.	9:48 a. m. 10:48 a. m.	1.04	0.10 0.82	0.18 0.94	0.31 0.99	0.40 1.12	0.45 1.24	0.48 1.42	0.50 1.49	0.51 1.59	0.53 1.67	0.56 1.83	2.08			
Wytheville, Va.	12	4:05 p. m.	4:30 p. m.	0.75	4:07 p. m.	4:27 p. m.	0.01	0.20	0.56	0.68	0.74										
Yankton, S. Dak.	22–23	9:45 p. m.	D. N.	1.27	10:09 p. m.	10:29 p. m.	0.23	0.31	0.40	0.51	0.59										
San Juan, Porto Rico	8	1:28 p. m.	4:00 p. m.	0.89	2:07 p. m.	2:28 p. m.	0.15	0.07	0.41	0.51	0.59										
Do	13	12:00 noon.	1:25 p. m.	0.82	12:43 p. m.	1:05 p. m.	0.06	0.05	0.21	0.48	0.67										

*Self-register not working.

TABLE V.—*Data furnished by the Canadian Meteorological Service, June, 1907.*

Stations.	Pressure, in inches. Actual, reduced to mean of 24 hours.	Pressure, in inches. Sea level, reduced to mean of 24 hours.	Pressure, in inches. Departure from normal.	Temperature. Mean.	Temperature. Departure from normal.	Temperature. Mean maximum.	Temperature. Mean minimum.	Precipitation. Total.	Precipitation. Departure from normal.	Precipitation. Total snowfall.
	Ins.	*Ins.*	*Ins.*	°	°	°	°	*Ins.*	*Ins.*	*Ins.*
St. Johns, N. F.	29.82	29.96	+.05	47.0	— 4.6	55.0	39.0	3.38	—0.22	
Sydney, C. B. I.	29.95	29.99	+.04	51.6	— 3.8	62.8	40.3	1.98	—1.25	
Halifax, N. S.	29.82	29.93	—.02	55.6	— 2.1	66.0	45.1	3.71	—0.05	
Grand Manan, N. B.	29.87	29.92	—.01	54.9	— 1.3	63.6	46.2	2.61	—0.33	
Yarmouth, N. S.	29.88	29.95	.00	51.1	— 3.9	57.9	44.3	1.51	—1.25	
Charlottetown, P. E. I.	29.90	29.94	+.02	55.6	— 1.8	64.4	46.8	1.41	—1.26	
Chatham, N. B.	29.90	29.92	+.03	59.0	— 1.0	71.6	46.4	3.75	+0.29	
Father Point, Que.	29.95	29.97	+.10	51.7	— 1.3	59.4	44.1	4.61	+1.63	
Quebec, Que.	29.59	29.91	—.01	60.2	— 1.0	69.7	50.8	4.97	+1.32	
Montreal, Que.	29.67	29.87	—.07	65.6	+ 0.7	74.2	57.1	3.50	—0.03	
Rockliffe, Ont.	29.30	29.90	—.04	63.7	+ 2.1	77.2	50.2	2.90	—0.26	
Ottawa, Ont.	29.63	29.95	+.01	67.2	+ 1.9	78.1	56.3	2.47	—0.45	
Kingston, Ont.	29.63	29.94	—.03	61.4	— 1.0	69.9	52.9	1.18	—1.25	
Toronto, Ont.	29.55	29.92	—.05	63.8	+ 0.4	73.8	53.7	2.12	—0.68	
White River, Ont.										
Port Stanley, Ont.	29.30	29.94	—.03	60.3	— 3.5	69.4	51.2	2.53	—0.20	
Saugeen, Ont.	29.25	29.95	—.02	60.4	0.0	71.4	49.4	1.36	—0.99	
Parry Sound, Ont.	29.25	29.93	—.03	63.6	+ 1.9	76.1	51.1	4.04	+1.62	
Port Arthur, Ont.	29.21	29.92	—.02	56.8	+ 0.4	67.8	45.9	0.74	—1.99	
Winnipeg, Man.	29.03	29.85	—.04	61.8	— 0.4	73.9	49.7	1.54	—1.75	
Minnedosa, Man.	28.05	29.84	—.05	58.0	— 1.6	68.5	47.6	3.98	+0.98	
Qu'Appelle, Sask.	27.60	29.81	—.06	58.3	— 1.6	68.9	47.8	6.11	+2.69	
Medicine Hat, Alberta.	27.52	29.76	—.09	61.6	— 0.4	73.5	49.7	1.69	—1.07	
Swift Current, Sask.	27.29	29.83	—.04	57.1	— 2.9	67.8	46.5	1.59	—1.08	
Calgary, Alberta	26.33	29.81	—.03	55.0	— 1.0	67.1	42.9	3.76	+1.31	
Banff, Alberta	25.32	29.85	+.01	51.1	— 0.4	63.4	38.8	2.80	—0.53	
Edmonton, Alberta.	27.52	29.77	—.07	57.0	+ 0.1	68.7	45.3	3.09	+0.23	
Prince Albert, Sask.	28.23	29.75	—.12	59.5	+ 1.8	71.8	47.3	2.53	+0.02	
Battleford, Sask.	28.08	29.79	—.07	60.7	+ 1.2	73.0	48.4	1.54	—1.77	
Kamloops, B. C.	28.66	29.86	—.01	64.2	+ 0.4	76.7	51.7	1.00	—0.42	
Victoria, B. C.	29.89	29.98	—.03	59.2	+ 2.9	68.7	49.6	0.33	—0.87	
Barkerville, B. C.										
Hamilton, Bermuda.	29.94	30.10	—.02	72.8	— 2.2	77.2	68.5	4.82	—1.13	
Dawson, Yukon										

TABLE VI.—*Heights of rivers referred to zeros of gages, June, 1907.*

Stations.	Distance to mouth of river.	Flood stage on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Milk River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Havre, Mont.	237	9	9.9	23	4.2	21, 22	5.1	5.7
Yellowstone River.								
Billings, Mont.	330	8	8.5	23	4.8	1	6.5	3.7
Cheyenne River.								
Rousseau, S. Dak.	7	12						
James River.								
Lamoure, N. Dak.	330	14	— 0.5	27	— 1.0	13, 14	— 0.8	0.5
Huron, S. Dak.	139	9	6.0	2, 3	2.3	30	4.3	3.7
Big Blue River.								
Beatrice, Nebr.	92	14	7.6	11	2.7	30	4.3	4.9
Blue Rapids, Kans.	47	14	10.6	12	4.1	7	5.8	6.5
Republican River.								
Clay Center, Kans.	42	18	8.3	10	6.0	7-9, 22-25	6.6	2.3
Solomon River.								
Beloit, Kans.	75	16	15.8	28	0.6	23	2.4	15.2
Smoky Hill-Kansas River.								
Lindsborg, Kans.	318	20	3.9	30	1.0	1	2.1	2.9
Abilene, Kans.	254	22	6.2	30	0.0	1-4	1.2	6.2
Manhattan, Kans	160	18	8.4	12	3.3	4	4.7	5.1
Topeka, Kans.	87	21	10.6	13	6.8	24	7.6	3.8
Osage River.								
Bagnell, Mo.	70	28	13.6	12	3.4	8	6.4	10.2
Gasconade River.								
Arlington, Mo.	98	16	12.9	3	0.7	23, 24	2.9	12.2
Missouri River.								
Townsend, Mont.	2,504	11	8.9	26, 27	6.5	2, 3	7.7	2.4
Fort Benton, Mont.	2,285	12	9.6	25, 26	5.1	1, 2	7.4	4.5
Wolfpoint, Mont. [a]	1,952	17	7.7	29	3.8	1, 2	5.6	3.9
Bismarck, N. Dak.	1,309	14	12.2	29	6.4	6	8.4	5.8
Pierre, S. Dak.	1,114	14	9.9	29, 30	5.6	8	7.6	4.3
Sioux City, Iowa	784	17	14.5	18	10.1	9, 10	12.2	4.4
Blair, Nebr.	705	15	13.6	1, 19	10.3	10	12.0	3.3
Omaha, Nebr.	669	18	17.6	1	13.9	10, 11	15.6	3.7
Plattsmouth, Nebr.	641	17	10.1	20-22	7.5	10	8.8	2.6
St. Joseph, Mo	481	10	10.9	22	7.7	11, 12	9.5	3.2
Kansas City, Mo.	388	21	19.8	24	16.1	12	18.0	3.7
Glasgow, Mo.	231	18	17.6	25	10.1	1	11.2	7.5
Boonville, Mo.	199	20	20.6	26	11.7	1	16.9	8.9
Hermann, Mo.	103	24	19.0	26	9.2	1	15.8	9.8
Minnesota River.								
Mankato, Minn	127	18	13.6	21, 22	5.7	6-8	10.3	7.9
St. Croix River.								
Stillwater, Minn.	23	11	10.6	19, 24	8.3	8, 11	9.7	2.3
Chippewa River.								
Chippewa Falls, Wis.	75	16	4.0	1	2.1	22	2.8	1.9
Red Cedar River.								
Cedar Rapids, Iowa	77	14	6.0	15	3.4	2	4.7	2.6
Des Moines River.								
Des Moines, Iowa	205	19	7.1	26	3.9	1, 2	5.7	3.2
Illinois River.								
La Salle, Ill.	197	18	18.0	6	15.7	30	17.0	2.3
Peoria, Ill.	135	14	14.2	1	13.0	29, 30	13.6	1.2
Beardstown, Ill.	70	12	12.6	13	11.4	1	12.1	1.2
Clarion River.								
Clarion, Pa.	32	10	3.5	6	1.6	30	2.4	1.9
Conemaugh River.								
Johnstown, Pa.	64	7	7.0	14	2.2	29, 30	3.1	4.8
Allegheny River.								
Warren, Pa.	177	14	5.0	7	0.9	23, 24	2.1	4.1
Franklin, Pa.	114	15	6.7	7	1.5	22	3.2	5.2
Parker, Pa.	73	20	6.5	7	1.8	29, 30	3.2	4.7
Freeport, Pa.	29	20	9.7	14, 15	4.0	30	6.3	5.7
Springdale, Pa.	17	27	13.8	8, 15	8.5	25, 30	10.6	5.3
Cheat River.								
Rowlesburg, W. Va.	36	14	6.6	14	2.0	1	3.4	4.6
Youghiogheny River.								
Confluence, Pa.	59	10	5.0	14	0.8	29	2.3	4.2
West Newton, Pa.	15	23	9.0	14	1.0	30	3.3	8.0
Monongahela River.								
Weston, W. Va.	161	18	8.7	14	— 0.6	28-30	1.0	9.3
Fairmont, W. Va.	119	25	20.8	14	14.8	1, 24, 28, 29	16.1	6.0
Greensboro, Pa.	81	18	15.5	15	7.6	1, 30	9.4	7.9
Lock No. 4, Pa.	40	28	20.9	15	7.0	1, 30	10.2	13.9
Beaver River.								
Ellwood Junction, Pa.	10	14	3.9	15	2.1	1	2.9	1.8
Muskingum River.								
Zanesville, Ohio	70	25	14.1	4	8.7	27, 30	10.8	5.4
Beverly, Ohio	20	25	12.0	8	6.7	28	8.9	5.3
Little Kanawha River.								
Glenville, W. Va	77	20	16.0	14	0.6	28	3.7	15.4
Creston, W. Va.	38	20	14.4	9	2.6	28, 29	5.4	11.8
New-Great Kanawha River.								
Radford, Va	213	14	10.5	14	0.8	1	3.6	9.7
Hinton, W. Va.	153	14	13.0	14	2.1	1	4.8	10.9
Charleston, W. Va.	58	30	33.0	14	4.8	30	9.6	28.2
Scioto River.								
Columbus, Ohio	110	17	8.4	3	2.0	27-30	4.0	6.4
Licking River.								
Falmouth, Ky.	30	25	17.6	13	2.0	30	6.4	15.6
Miami River.								
Dayton, Ohio	77	18	7.9	11	2.0	22	3.9	5.9
Kentucky River.								
Beattyville, Ky	254	30	13.6	3	0.4	23	3.1	13.2
High Bridge, Ky.	117	17	16.8	5	9.9	1	12.4	6.9
Frankfort, Ky.	65	31	11.7	5	6.3	1	8.2	5.4
Wabash River.								
Terre Haute, Ind.	171	16	14.0	6, 7	4.4	22	8.1	9.6
Mount Carmel, Ill.	75	15	17.5	9	6.3	24	11.1	11.2
Cumberland River.								
Burnside, Ky.	518	50	34.1	9	1.7	30	7.3	32.4
Celina, Tenn.	383	45	31.8	11	3.0	27, 30	9.4	28.8
Carthage, Tenn.	308	40	26.0	12	2.9.	30	8.0	23.1
Nashville, Tenn	193	40	27.0	13	8.8	30	13.7	18.2
Clarksville, Tenn.	126	43	30.5	15	5.9	30	15.0	24.6

Stations.	Distance to mouth of river.	Flood stage on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Powell River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Tazewell, Tenn.	44	20	6.4	10	0.8	28-30	3.1	5.6
Clinch River.								
Speers Ferry, Va.	156	20	22.0	14	0.3	1	3.5	21.7
Clinton, Tenn	52	25	25.6	16	4.4	1	10.0	21.2
South Fork Holston River.								
Bluff City, Tenn.	35	12	11.7	14	1.3	1	3.2	10.4
Holston River.								
Mendota, Va	165	8	17.5	14	1.2	1	3.3	16.3
Rogersville, Tenn.	103	14	14.0	15	2.2	1	4.5	11.8
French Broad River.								
Asheville, N. C.	144	4	1.4	2	— 0.3	17-20	0.2	1.7
Dandridge, Tenn.	46	12	5.5	9	1.4	1, 21-24	2.4	4.1
Little Tennessee River.								
McGhee, Tenn	17	20	7.7	29	3.6	17-19	4.5	4.1
Hiwassee River.								
Charleston, Tenn	18	22	5.8	2	2.0	22	3.4	3.8
Tennessee River.								
Knoxville, Tenn.	635	12	12.2	16	1.9	1	5.5	10.3
Loudon, Tenn.	590	25	10.0	16	2.5	1	4.6	7.5
Kingston, Tenn.	556	25	13.9	16	2.4	24	5.7	11.5
Chattanooga, Tenn.	452	33	15.3	17	4.5	1	8.6	10.8
Bridgeport, Ala	402	24	12.0	18	2.7	1	5.9	9.3
Guntersville, Ala.	349	31	16.8	19	5.7	1	9.2	11.1
Florence, Ala.	255	16	9.0	19	3.7	24, 26	5.6	5.3
Riverton, Ala.	225	26	14.3	20	6.0	26	9.2	8.3
Johnsonville, Tenn.	95	21	12.7	21	6.3	29	8.9	6.4
Ohio River.								
Pittsburg, Pa.	966	22	13.9	15	2.9	24	6.3	11.0
Dam No. 2, Pa.	956	25	13.4	15	3.7	30	7.0	9.7
Beaver Dam, Pa.	925	27	19.2	15	6.6	30	10.5	12.6
Wheeling, W. Va.	875	36	19.0	16	6.3	28	10.3	12.7
Parkersburg, W. Va	785	36	18.6	17	7.5	28	11.7	11.1
Point Pleasant, W. Va.	703	39	32.6	16	7.7	29	16.6	24.9
Huntington, W. Va	660	50	39.5	15	11.7	28, 29	22.0	27.8
Catlettsburg, Ky.	651	50	41.0	15	11.0	29	22.5	30.0
Portsmouth, Ohio	612	50	41.7	16	12.0	29	24.0	29.7
Maysville, Ky.	559	50	40.7	16	12.2	30	24.3	28.5
Cincinnati, Ohio.	499	50	43.0	17	14.2	30	27.2	28.8
Madison, Ind	413	46	35.7	17	12.8	29, 30	23.9	22.9
Louisville, Ky.	367	28	16.7	18	5.9	29, 30	10.2	10.8
Evansville, Ind	184	35	32.3	20	12.5	30	23.4	19.8
Mount Vernon, Ind.	148	35	30.8	21	12.6	30	22.9	18.2
Paducah, Ky.	47	40	28.7	17	13.3	1	23.5	15.4
Cairo, Ill.	1	45	38.4	18	22.9	1	33.4	15.5
St. Francis River.								
Marked Tree, Ark.	104	17	16.7	7-9	13.4	30	15.3	3.3
Neosho River.								
Neosho Rapids, Kans.	326	22	12.8	25	1.2	18	3.1	11.6
Iola, Kans.	262	10	5.1	26	0.0	20	1.3	5.1
Oswego, Kans.	184	20	16.8	28	0.4	9	3.3	16.4
Fort Gibson, Ind. T.	3	22	18.0	28	9.4	23, 24	11.2	8.6
Canadian River.								
Calvin, Ind. T.	99	10	5.4	11, 23, 28	2.9	19, 20	3.9	2.5
Black River.								
Blackrock, Ark.	67	12	19.0	2	8.0	26-28	12.7	11.0
White River.								
Calicorock, Ark	272	18	22.7	2	2.1	25	6.1	20.6
Batesville, Ark.	217	18	24.2	3	4.2	24-27	8.5	20.0
Newport, Ark.	185	26						
Clarendon, Ark.	75	30	28.4	1	23.0	30	26.9	5.4
Arkansas River.								
Pueblo, Colo.	1334	10	5.7	30	3.4	4, 13, 14	4.2	2.3
Wichita, Kans.	832	10	0.9	25	— 1.4	18	— 1.0	2.3
Tulsa, Ind. T.	551	16	10.5	28	3.5	19, 20	5.3	7.0
Webbers Falls, Ind. T.	465	23	18.0	29	4.6	21	7.9	13.4
Fort Smith, Ark	403	22	17.6	30	4.5	22	7.9	13.1
Dardanelle, Ark.	256	21	15.5	30	4.0	25	7.6	11.5
Little Rock, Ark.	176	23	15.0	3	5.5	25, 26	9.6	9.5
Pine Bluff, Ark.	121	25	17.8	4	8.5	27	12.5	9.3
Yazoo River.								
Greenwood, Miss	175	38	31.0	3-7	17.9	30	27.5	13.1
Yazoo City, Miss.	80	25	23.7	1-3	20.6	30	22.4	3.1
Ouachita River.								
Camden, Ark.	304	39	32.6	6	6.0	26	16.7	26.6
Monroe, La	122	40	36.3	1	31.0	30	34.7	5.3
Red River								
Denison, Tex.	768	22	10.2	1	4.3	20, 21, 24	6.3	5.9
Arthur City, Tex.	688	27	21.0	2	10.5	21, 22	13.8	10.5
Fulton, Ark.	515	28	31.5	4	13.4	24	22.9	18.1
Shreveport, La.	327	29	26.9	13	12.9	27	20.7	14.0
Alexandria, La.	118	33	32.6	18, 19	21.0	30	29.5	11.6
Mississippi River.								
Fort Ripley, Minn.	2,082	10	8.8	15	6.1	30	7.5	2.7
St. Paul, Minn.	1,964	14	11.0	18, 19	7.6	10	9.7	3.4
Red Wing, Minn.	1,914	14	7.3	24-26	6.0	11	6.8	1.3
Reeds Landing, Minn.	1,884	12	6.6	25-27, 30	5.6	12-14	6.2	1.0
La Crosse, Wis.	1,819	12	7.8	29	6.7	15, 16	7.2	1.1
Prairie du Chien, Wis.	1,759	18	8.1	8-12	7.3	21, 22	7.8	0.8
Dubuque, Iowa.	1,699	15	8.9	12	7.7	21, 22	8.3	1.2
Clinton, Iowa.	1,629	16	8.4	12, 13	7.1	22	7.8	1.3
Leclaire, Iowa.	1,609	10	5.0	1	3.9	25-27	4.4	1.1
Davenport, Iowa	1,593	15	7.7	13	6.4	22, 23	7.0	1.3
Muscatine, Iowa	1,562	16	9.2	13, 14	7.8	28	8.4	1.4
Galland, Iowa.	1,472	8	5.2	14	4.0	7	4.5	1.2
Keokuk, Iowa.	1,463	15	9.6	12, 13	7.1	6, 7	8.1	2.5
Warsaw, Ill.	1,458	18	12.7	12	10.0	6	11.1	2.7
Hannibal, Mo	1,402	13	11.5	13	8.2	7, 8	9.4	3.3
Grafton, Ill	1,306	23	14.7	14	11.2	9	12.6	3.5
St. Louis, Mo.	1,264	30	24.5	28	14.7	1	21.1	9.8
Chester, Ill	1,189	30	21.0	28, 29	13.3	1	18.3	7.7
Cape Girardeau, Mo.	1,128	28	25.5	17	17.7	1	22.9	7.8
New Madrid, Mo.	1,003	34	30.8	18, 19	18.6	1	27.0	12.2
Luxora, Ark	905	33	24.5	21	12.0	1	20.2	12.5
Memphis, Tenn	843	33	29.5	21	17.1	2	25.2	12.4

TABLE VI.—*Heights of rivers referred to zeros of gages*—Continued.

Stations.	Distance to mouth of river.	Flood stage on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River—Cont'd.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Helena, Ark.	767	42	38.0	23–25	24.2	4	33.0	13.8
Arkansas City, Ark.	635	42	41.9	1	35.8	7	39.4	6.1
Greenville, Miss.	595	42	37.0	1	30.2	7,8	33.3	6.8
Vicksburg, Miss.	474	45	44.7	1	37.3	11	39.5	7.4
Natchez, Miss.	373	46	45.8	1	39.4	14–18	41.2	6.4
Baton Rouge, La.	240	35	35.1	1	30.6	19–21,23–25	32.0	4.5
Donaldsonville, La	188	28	27.9	2	24.0	18–26	25.2	3.9
New Orleans, La.	108	16	17.8	1,3	15.4	19,26	16.2	2.4
Atchafalaya River.								
Simmesport, La.	127	33	40.8	3	36.3	30	37.8	4.5
Melville, La.	103	31	36.4	1–4	33.9	21,29,30	34.8	2.5
Morgan City, La.	19	8	5.5	10,12	4.0	3	4.8	1.5
Sandusky River.								
Tiffin, Ohio.	65	7	4.5	3	0.6	20–22	1.8	3.9
Grand River.								
Grand Rapids, Mich.	38	11	2.7	1	2.1	{6,10,14, 16–25, 29,30}	2.2	0.6
Connecticut River.								
Hartford, Conn.	50	16	8.0	7	2.5	22	4.7	5.5
Mohawk River.								
Tribeshill, N. Y.	42	12	2.3	7,8	0.2	24-26,28-30	0.7	2.1
Schenectady, N. Y.	19	15	2.5	3	0.3	29,30	1.5	2.2
Hudson River.								
Troy, N. Y.	134	14	4.7	1,7	3.0	26,28	4.0	1.7
Albany, N. Y.	147	12	4.8	1	1.5	21	3.6	3.3
Pompton River.								
Pompton Plains, N. J.	6	8	4.8	6	3.7	26	4.2	1.1
Passaic River.								
Chatham, N. J.	69	7	3.2	3	2.2	22–26, 29	2.5	1.0
Lehigh River.								
Mauch Chunk, Pa.	45	15	5.3	3	4.2	1	4.6	1.1
Schuylkill River.								
Reading, Pa.	66	12	1.0	3	0.1	27	0.5	0.9
Delaware River.								
Hancock (E. Branch), N. Y.	287	12	4.1	3, 6, 7	2.9	25–27, 29	3.5	1.2
Hancock (W. Branch), N. Y.	287	10	3.9	8	2.9	26, 27	3.3	1.0
Port Jervis, N. Y.	215	14	2.2	4	0.4	26–28	1.1	1.8
Phillipsburg, N. J.	146	26	4.1	3, 4	1.4	29	2.4	2.7
Trenton, N. J.	92	18	3.1	3	1.2	26	2.1	1.9
North Branch Susquehanna.								
Binghamton, N. Y.	195	16	2.9	8	2.0	27, 28	2.3	0.9
Towanda, Pa.	139	16	2.4	4	0.7	29, 30	1.5	1.7
Wilkes-Barre, Pa.	60	17	5.2	5	3.2	26, 29	4.0	2.0
West Branch Susquehanna.								
Clearfield, Pa.	165	8	2.7	3	1.2	1	1.8	1.5
Renovo, Pa.	90	16	5.0	3	1.5	21, 22	2.8	3.5
Williamsport, Pa.	39	20	6.0	4	2.0	1, 23	3.4	4.0
Juniata River.								
Huntingdon, Pa.	90	24	5.8	2	3.5	1	4.5	2.3
Susquehanna River.								
Selinsgrove, Pa.	116	17	3.8	4	1.5	21,23,24,29	2.3	2.3
Harrisburg, Pa.	69	17	4.6	4,5	2.1	24, 25	3.0	2.5
Shenandoah River.								
Riverton, Va.	58	22	10.6	3	− 0.8	1	1.6	11.4
Potomac River.								
Cumberland, Md.	290	8						
Harpers Ferry, W. Va.	172	18	15.2	3	2.4	28–30	5.9	12.8
James River.								
Buchanan, Va.	305	12	17.4	14	2.8	1	5.4	14.6
Lynchburg, Va.	260	18	11.7	15	1.7	1	4.1	10.0
Columbia, Va.	167	18	28.1	2	5.8	24	10.0	22.3
Richmond, Va.	111	12	14.7	3	0.5	9	3.1	14.2
Dan River.								
Danville, Va.	55	8	6.8	2	0.0	22, 23	0.9	6.8
Staunton River.								
Randolph, Va.	26	28	23.1	3	4.5	1	9.4	18.6
Roanoke River.								
Clarksville, Va.	196	12	8.6	3	0.4	1	2.4	8.2
Weldon, N. C.	129	30	34.0	4	10.7	1	15.8	23.3
Tar River.								
Tarboro, N. C.	46	25	19.4	6,7	3.8	1	9.0	15.6
Greenville, N. C.	21	22	14.4	9	4.9	1	8.9	9.5
Haw River.								
Moncure, N. C.	171	25	16.7	2	2.3	9	6.8	14.7
Cape Fear River.								
Fayetteville, N. C.	112	38	28.0	3	4.4	1	11.7	23.6
Waccamaw River.								
Conway, S. C.	40	7	5.0	30	2.6	9	3.4	2.4
Pedee River.								
Cheraw, S. C.	149	27	22.3	4	2.8	1, 11, 22	8.8	19.5
Smiths Mills, S. C.	51	16	13.1	21	6.6	2	11.2	6.5
Lynch Creek.								
Effingham, S. C.	35	12	8.8	21	5.0	27	6.9	3.8
Black River.								
Kingstree, S. C.	45	12	4.4	15	3.0	20–23	3.6	1.4
Catawba-Wateree River.								
Mount Holly, N. C.	143	15	4.8	2	1.9	22, 23	2.4	2.9
Catawba, S. C.	107	11	11.6	3	2.2	21	4.0	9.4
Camden, S. C.	87	24	26.3	3	5.2	24	11.2	21.1
Broad River.								
Blairs, S. C.	36	14	9.5	2	0.1	22	2.5	9.4
Saluda River.								
Pelzer, S. C.	109	7	4.5	2	2.6	7–9, 17–21	3.0	1.9
Chappels, S. C.	56	14	10.2	2	2.1	19, 21	4.1	8.1
Congaree River.								
Columbia, S. C.	52	15	9.0	3	0.9	9, 21, 23	2.5	8.1
Santee River.								
Rimini, S. C.	108	12	18.5	8,9	6.5	24	10.5	7.0
St. Stephens, S. C.	50	10	9.0	13–15	5.0	26	7.5	4.0
Edisto River.								
Edisto, S. C.	75	6	5.3	4	1.8	28	3.5	3.5
Broad River.								
Carlton, Ga.	30	11	5.3	1	2.2	12, 13	2.6	3.1
Savannah River.								
Calhoun Falls, S. C.	347	15	4.9	2	2.7	25, 26	3.3	2.2
Augusta, Ga.	268	32	15.0	2	5.9	24	8.6	9.1
Oconee River.								
Milledgeville, Ga.	147	25	11.0	30	2.0	24	3.5	9.0
Dublin, Ga.	79	30	4.0	3,4	− 0.4	24, 25	1.0	4.4
Ocmulgee River.								
Macon, Ga.	203	18	9.7	29	1.5	25	3.2	8.2
Abbeville, Ga.	96	11	5.6	18	1.8	26, 27	3.3	3.8
Flint River.								
Woodbury, Ga.	227	10	4.3	29	0.2	21–23	0.8	4.1
Montezuma, Ga.	152	20	5.9	30	2.6	24–27	3.3	3.3
Albany, Ga.	90	20	2.3	6	0.5	25	1.4	1.8
Bainbridge, Ga.	29	22	4.3	1	2.1	25–28	3.1	2.2
Chattahoochee River.								
Oakdale, Ga.	305	18	6.0	1, 2	3.8	26	4.5	2.2
West Point, Ga.	239	20	4.5	4	2.5	25	3.1	2.0
Eufaula, Ala.	90	40	7.7	30	1.8	23, 24	4.2	5.9
Alaga, Ala.	30	25	6.8	6	3.5	23	4.9	3.3
Coosa River.								
Rome, Ga.	266	30	9.4	1	1.6	23, 24	3.7	7.8
Gadsden, Ala.	162	22	11.3	3	2.4	24	4.7	8.9
Lock No. 4, Ala.	113	17	9.9	2	1.8	24, 25	3.8	8.1
Wetumpka, Ala.	12	45	15.9	3	5.1	23, 24	8.9	10.8
Tallapoosa River.								
Milstead, Ala.	42	35	6.8	14	2.5	21, 22	4.0	4.3
Alabama River.								
Montgomery, Ala.	323	35	12.6	4	3.2	23, 24	6.4	9.4
Selma, Ala.	246	35	15.1	5	4.1	24, 25	8.1	11.0
Black Warrior River.								
Tuscaloosa, Ala.	90	43	29.7	2	6.0	24	11.3	23.7
Tombigbee River.								
Columbus, Miss.	316	33	10.9	5	− 1.2	30	3.3	12.1
Vienna, Ala.	246	42	21.0	1	6.0	22	9.5	15.0
Demopolis, Ala.	168	35	27.9	4	3.3	24, 25, 28	13.3	24.6
Leaf River.								
Hattiesburg, Miss.	60	20	12.6	2	3.7	23, 24	5.4	8.9
Chickasawhay River.								
Enterprise, Miss.	144	18	5.4	1	1.4	19, 20	2.6	4.0
Shubuta, Miss.	106	25	17.0	1	4.0	15–30	6.2	13.0
Pascagoula River.								
Merrill, Miss.	78	20	18.2	4	4.3	26	9.4	13.9
Pearl River.								
Jackson, Miss.	242	20	8.8	1	2.3	27	4.3	6.5
Columbia, Miss.	110	14	17.8	1	4.7	22	7.1	13.1
Sabine River.								
Logansport, La.	315	25	24.4	1	4.8	30	19.4	19.6
Neches River.								
Rockland, Tex.	105	20	20.5	3	5.1	30	11.1	15.4
Beaumont, Tex.	18	10	10.9	2	1.7	29, 30	4.6	9.2
Trinity River.								
Dallas, Tex.	320	25	30.4	8	4.5	30	14.9	25.9
Long Lake, Tex.	211	35	41.0	5	8.7	28	33.5	32.3
Riverside, Tex.	112	40	31.1	1, 2	5.5	30	26.1	25.6
Liberty, Tex.	20	25	26.0	6–8	24.4	30	25.3	1.6
Brazos River.								
Kopperl, Tex.	345	21	9.0	21	0.6	30	1.7	8.4
Waco, Tex.	285	22	10.6	1	3.9	17	6.1	6.7
Valley Junction, Tex.	215	40	13.0	1	2.0	16-21,27-30	4.2	11.0
Hempstead, Tex.	140	40	30.6	3	2.6	22	11.3	28.0
Booth, Tex.	61	39	30.3	1	3.4	21, 22	11.3	26.9
Colorado River.								
Ballinger, Tex.	489	21	6.2	12	0.5	4,5	1.4	5.7
Austin, Tex.	214	18	7.7	24	1.0	19–21	2.7	6.7
Columbus, Tex.	98	24	34.2	1	7.1	19–21, 24	11.4	27.1
Guadalupe River.								
Gonzales, Tex.	112	22	25.0	1	0.6	30	2.5	24.4
Victoria, Tex.	35	16	22.1	4	1.9	30	6.4	20.2
Rio Grande.								
San Marcial, N. Mex.	1233	11	11.7	21	9.7	30	10.6	2.0
El Paso, Tex.	1030	14	12.5	1, 2, 24	11.2	7, 8	11.9	1.3
Red River of the North.								
Moorhead, Minn.	284	26	19.3	17	10.7	8, 9	13.5	8.6
Kootenai River.								
Bonners Ferry, Idaho	123	24	23.7	30	21.3	1	22.6	2.4
Pend D'oreille River.								
Newport, Wash.	85	14	16.7	15	14.6	1	15.8	2.1
Snake River.								
Lewiston, Idaho	144	24	15.5	2	11.7	27	13.3	3.8
Riparia, Wash.	67	30	15.0	3	11.5	27, 28	13.0	3.5
Columbia River.								
Wenatchee, Wash.	473	40	34.9	4	32.6	27	33.9	2.3
Umatilla, Oreg.	270	25	20.5	4	17.7	27	19.4	2.8
The Dalles, Oreg.	166	40	34.1	5	29.0	22	31.5	5.1
Willamette River.								
Albany, Oreg.	118	20	3.3	13, 14	2.1	28–30	2.7	1.2
Salem, Oreg.	84	20	2.2	14, 16, 17	1.1	29, 30	1.7	1.1
Portland, Oreg.	12	15	19.2	6–8, 10	16.5	29, 30	18.0	2.7
Sacramento River.								
Kennett, Cal.	323	23						
Red Bluff, Cal.	265	23	6.0	13	2.7	30	3.6	3.3
Colusa, Cal.	156	25	11.8	14	7.5	30	9.6	4.3
Knights Landing, Cal.	99	.....	13.6	1, 2	10.8	30	12.6	2.8
Sacramento, Cal.	64	25	19.6	2	17.8	30	18.7	1.8
San Joaquin River.								
Pollasky, Cal.	203	10	8.0	3	3.8	16	5.8	4.2
Firebaugh, Cal.	148	.....	12.5	8	10.5	19, 20	11.5	2.0
Lathrop, Cal.	49	14	17.0	5, 6	15.1	29	16.1	1.9

(*) One day missing.

Honolulu, T. H., latitude 21° 19′ north, longitude 157° 30′ west; barometer above sea, 38 feet; gravity correction, —0.057 inch, applied. June, 1907.

Day.	Pressure.*		Air temperature.				Moisture.				Wind.				Precipitation.		Clouds.					
							8 a. m.		8 p. m.		8 a. m.		8 p. m.				8 a. m.			8 p. m.		
	8 a. m.	8 p. m.	8 a. m.	8 p. m.	Maximum.	Minimum.	Wet.	Relative humidity.	Wet.	Relative humidity.	Direction.	Velocity.	Direction.	Velocity.	8 a. m.	8 p. m.	Amount.	Kind.	Direction.	Amount.	Kind.	Direction.
1	30.02	30.02	77.5	76.0	84	72	71.5	74	70.0	74	w.	5	ne.	3	0.00	0.00	1	Cu.	ne.	2	A.-s.	w.
2	30.03	30.01	80.5	77.0	84	73	71.0	63	70.0	71	e.	3	ne.	5	0.00	0.00	2	Cu.	e.	1	Cu.	ne.
3	30.02	29.98	80.0	76.5	83	74	71.5	66	71.0	76	ne.	4	ne.	9	0.01	0.01	5	Cu.	e.	4	Cu.	ne.
4	29.97	29.97	78.0	72.0	83	71	71.0	71	71.0	95	ne.	5	ne.	2	0.01	0.05	5	Cu.	ne.	5	N.	ne.
5	30.01	29.99	76.8	75.8	83	72	68.3	65	68.8	70	e.	12	e.	8	0.05	T.	3 2	Cu. N.	e. e.	7	S.	ne.
6	30.03	30.02	77.0	75.0	82	71	69.0	67	69.0	74	ne.	12	ne.	4	0.01	T.	3	Cu.	e.	2	Cu.-n.	ne.
7	30.05	30.03	77.5	77.0	82	73	69.5	67	69.0	67	ne.	10	ne.	12	0.01	0.00	4 2	S.-cu. Cu.-n.	se. 0	0	0	0
8	30.05	30.05	78.5	75.0	81	74	69.5	64	69.0	74	ne.	10	ne.	3	T.	T.	2 2	A.-cu. Cu.-n.	e. e.	2	A.-s.	nw.
9	30.08	30.05	77.3	75.0	82	72	68.0	62	68.0	70	ne.	12	e.	9	0.00	T.	1 1	A.-cu. Cu.	se. e.	1	Cu.	ne.
10	30.05	30.00	76.0	75.0	83	71	69.0	70	72.0	86	ne.	13	ne.	9	0.01	T.	2	N.	e.	3 3	Cu. Cu.-n.	ne. ne.
11	30.01	29.99	78.5	75.0	82	72	69.0	62	68.0	70	e.	4	e.	4	0.02	0.00	3	Cu.	e.	2	Cu.	e.
12	29.98	29.97	79.0	76.0	82	73	69.3	61	68.0	66	e.	6	ne.	9	0.00	0.00	2	Cu.	e.	few.	Cu.	ne.
13	29.98	30.00	78.0	74.0	82	72	70.0	67	69.0	78	ne.	9	ne.	8	0.00	T.	2	Cu.	ne.	2	N.	ne.
14	30.00	29.98	78.0	76.0	82	74	69.0	63	68.0	66	e.	7	ne.	12	T.	0.00	5 2	A.-s. Cu.	nw. se.	few.	Cu.	ne.
15	29.98	29.96	77.5	77.0	83	72	68.5	63	69.0	67	e.	4	e.	14	0.00	0.00	4	Cu.	e.	5	Cu.	ne.
16	29.95	29.93	77.5	75.0	83	73	67.0	58	68.0	70	ne.	8	ne.	9	0.00	T.	5	Cu.	e.	1	Cu.	ne.
17	29.95	29.91	76.0	75.0	80	72	69.0	70	69.0	74	ne.	12	sw.	6	T.	0.04	9	S.-cu.	e.	6	Cu.	ne.
18	29.95	29.96	77.2	75.0	83	70	70.0	70	70.0	78	s.	4	n.	4	0.00	0.00	1 1	A.-s. Cu.	0 0	2 7	S.-cu. S.	n. n.
19	29.98	30.01	78.0	75.0	82	72	71.5	73	70.0	78	sw.	3	se.	10	0.00	0.00	3 2	A.-s. Cu.	w. sw.	10	S.	0
20	30.04	30.04	78.0	77.5	81	72	71.5	73	73.0	81	s.	5	ne.	1	0.00	0.00	few.	Cu.	0	6	Cu.	sw.
21	30.06	30.05	78.5	75.2	84	73	73.0	77	72.2	86	sw.	4	ne.	9	0.02	0.23	6	S.-cu.	sw.	9	N.	ne.
22	30.06	30.04	80.0	76.0	83	74	71.0	64	69.0	70	e.	1	ne.	4	T.	0.00	7	Cu.	ne.	1	Cu.	ne.
23	30.06	30.01	78.0	75.9	82	74	69.0	63	67.9	66	e.	5	ne.	10	0.00	0.00	7	Cu.	ne.	1 7	S.-cu. Cu.	ne. ne.
24	30.03	30.01	78.3	75.5	82	74	69.0	62	68.5	70	ne.	9	e.	12	0.00	0.00	1	Cu.	ne.	4	Cu.	ne.
25	30.00	30.00	79.0	77.0	84	73	69.0	60	68.0	63	e.	4	e.	9	0.00	0.00	2	Cu.	ne.	7 3	A.-cu. Cu.	nw. ne.
26	30.00	30.00	78.0	76.0	83	74	69.0	63	68.0	66	e.	7	ne.	9	0.00	T.	few.	Cu.	ne.	9	N.	ne.
27	30.02	29.98	78.4	75.4	80	73	70.0	66	68.9	72	ne.	5	ne.	9	0.01	T.	8 2	Ci. Cu.	sw. ne.	1	S.	ne.
28	29.98	29.94	78.0	75.0	82	73	69.0	63	69.0	74	ne.	6	e.	6	0.00	0.00	3	Cu.	e.	8	Cu.	ne.
29	29.95	29.95	78.5	76.0	82	71	69.0	62	67.0	62	e.	7	ne.	10	T.	T.	1	Cu.	e.	1	Cu.	ne.
30	29.98	29.96	78.4	76.2	81	73	67.0	55	68.0	65	e.	12	ne.	7	T.	0.00	few.	Cu.	e.	0	0	0
31																						
Mean	30.009	29.994	78.1	75.6	82.3	72.6	69.6	65.5	69.2	72.6	ne.	6.9	ne.	7.5	0.15	0.33	3.7	Cu.	e.	4.1	Cu.	ne.

Observations are made at 8 a.m. and 8 p. m., local standard time, which is that of 157° 30′ west, and is 5h and 30m slower than 75th meridian time. *Pressure values are reduced to sea level and standard gravity.

RAINFALL IN JAMAICA.

Thru the kindness of Dr. H. H. Cousins, chemist to the government of Jamaica and now in charge of the meteorological service of that island, we have received the following table.

The rainfall for June was much below the average for the whole island. The greatest fall, 16.04 inches, occurred at Westfield, in the northern division, while the least, 0.61 inch, fell at Agualta Vale, in the northeastern division.

Comparative table of rainfall.

[Based upon the average stations only.]

JUNE, 1907.

Divisions.	Relative area.	Number of stations.	Rainfall.	
			1907.	Average.
	Per cent.		*Inches.*	*Inches.*
Northeastern division	25	24	6.74	10.73
Northern division	22	50	3.60	5.46
West-central division	26	23	8.55	10.24
Southern division	27	28	4.93	6.85
Means	100		5.96	8.32

Chart I. Hydrographs for Seven Principal Rivers of the United States, June, 1907.

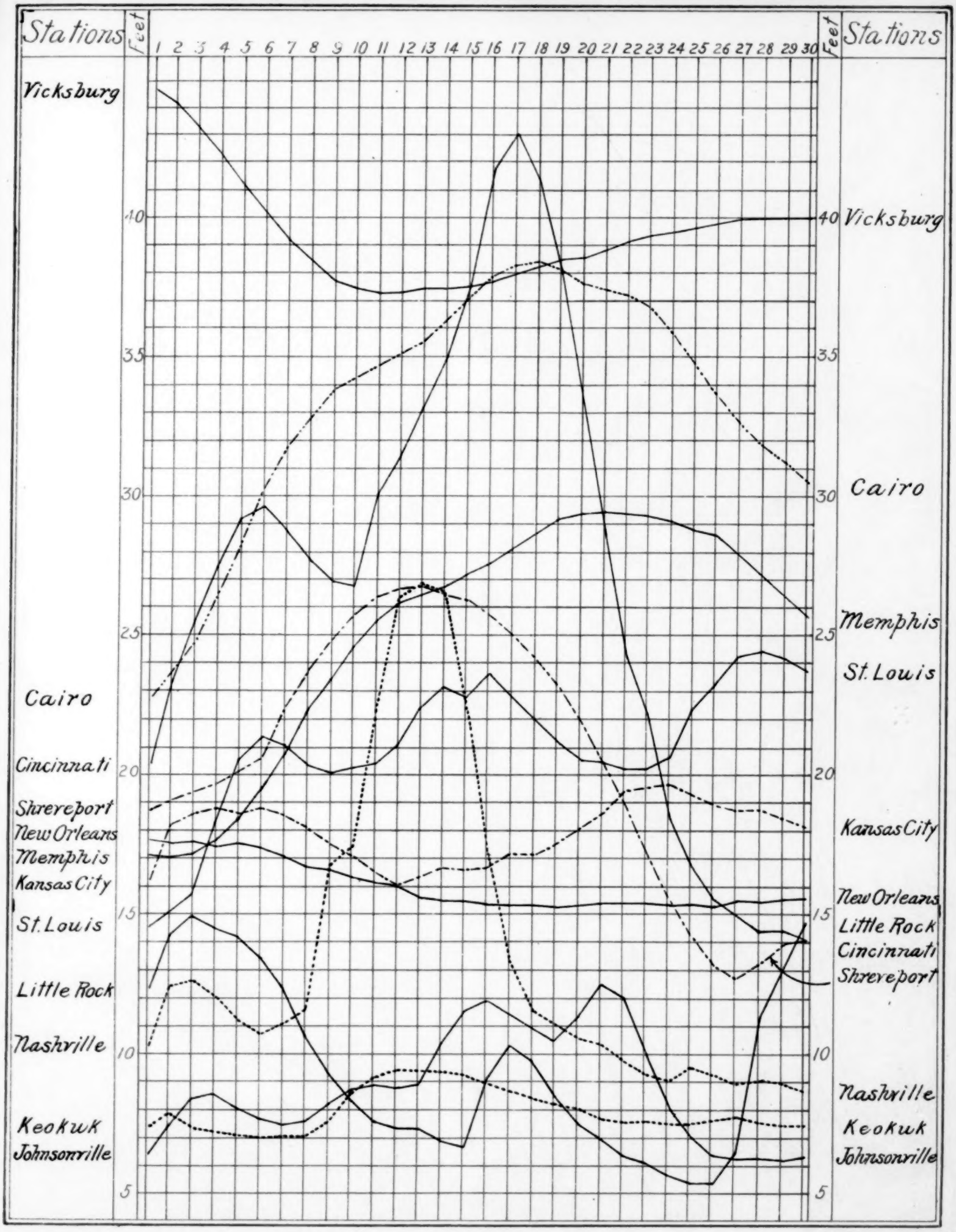

Chart II. Tracks of Centers of High Areas, June, 1907.

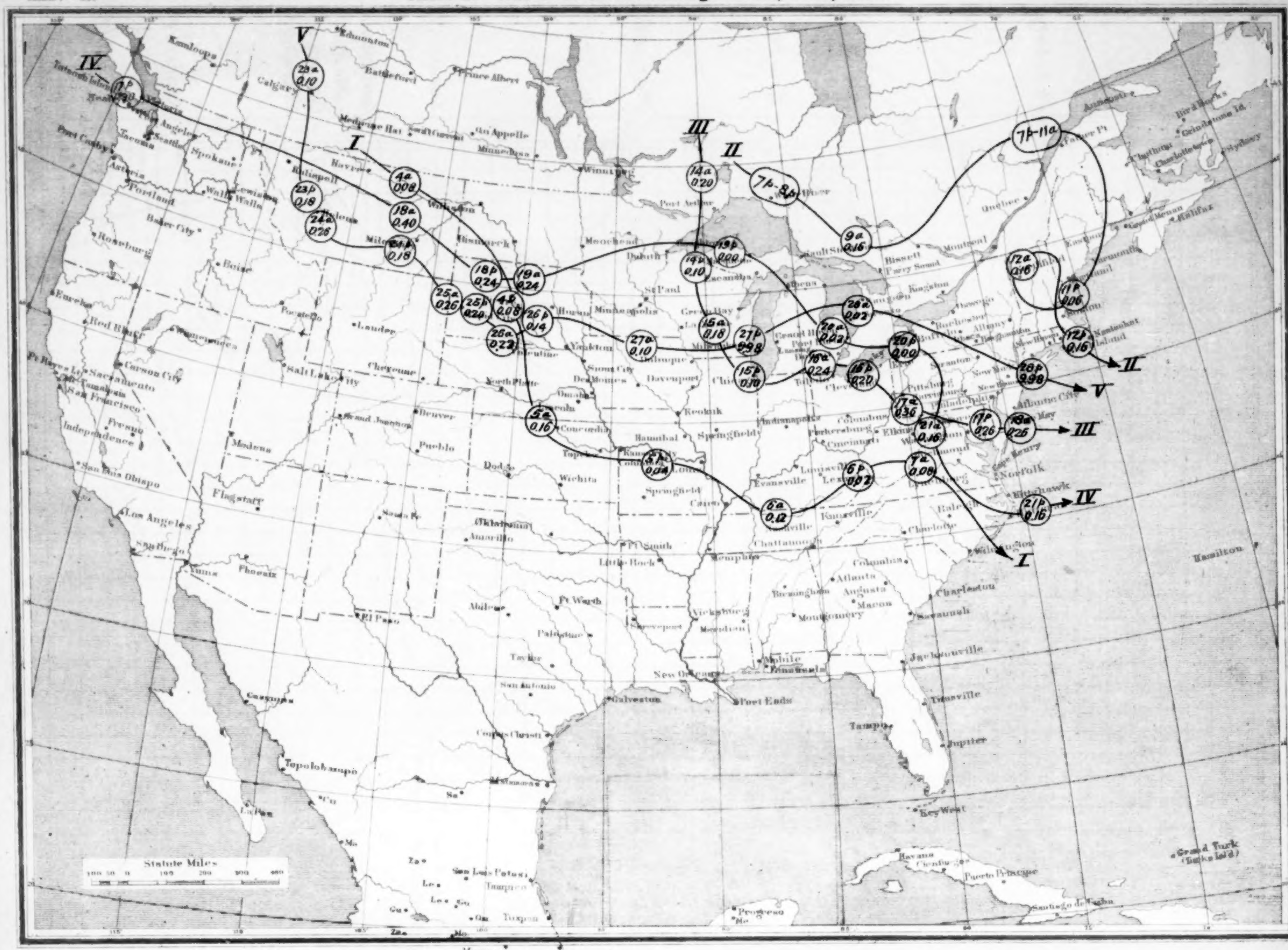

Chart III. Tracks of Centers of Low Areas, June, 1907.

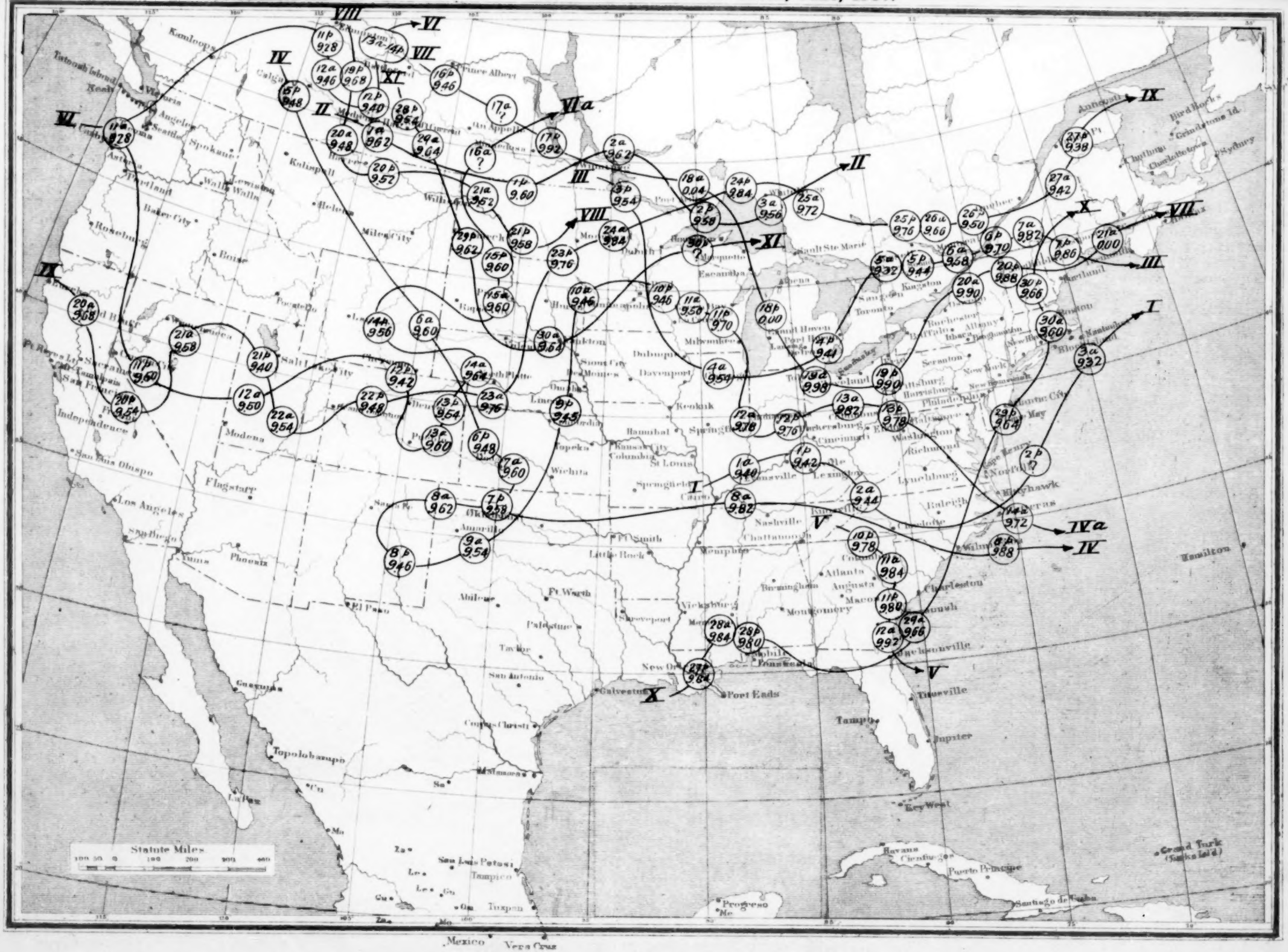

Chart IV. Total Precipitation, June, 1907.

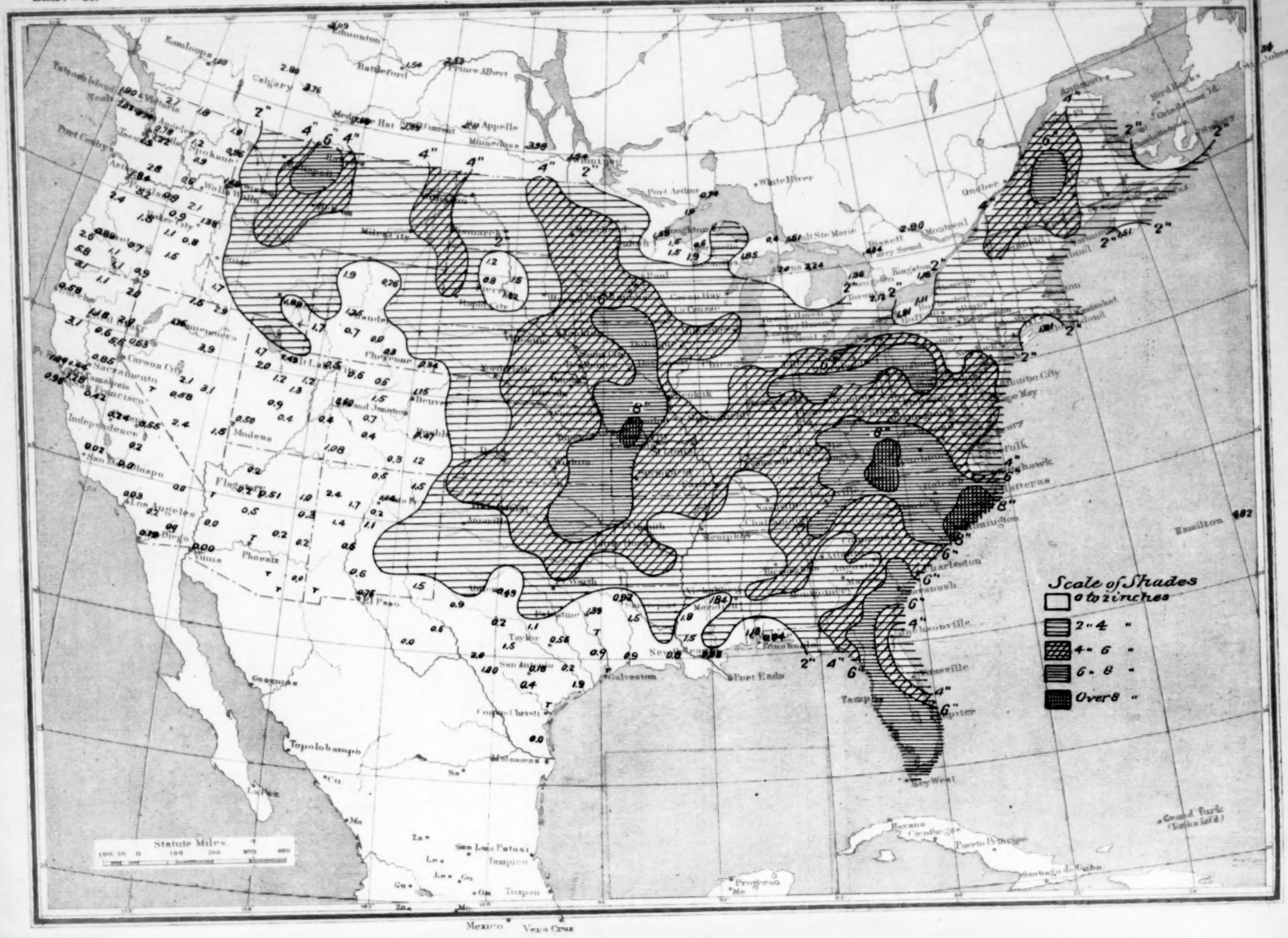

Chart V. Percentage of Clear Sky between Sunrise and Sunset, June, 1907.

• Barkerville

Chart V. Percentage of Clear Sky between Sunrise and Sunset, June, 1907.

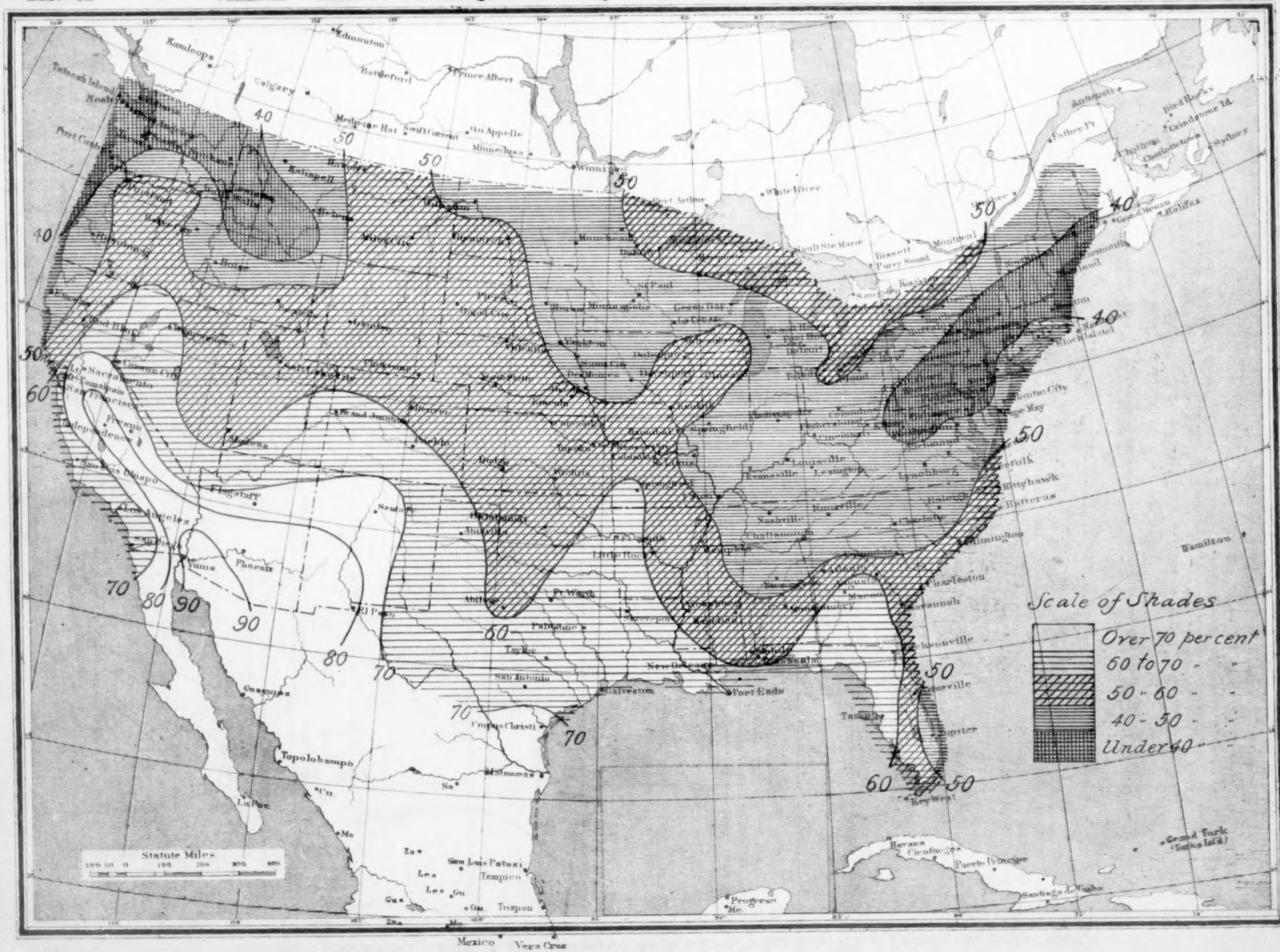
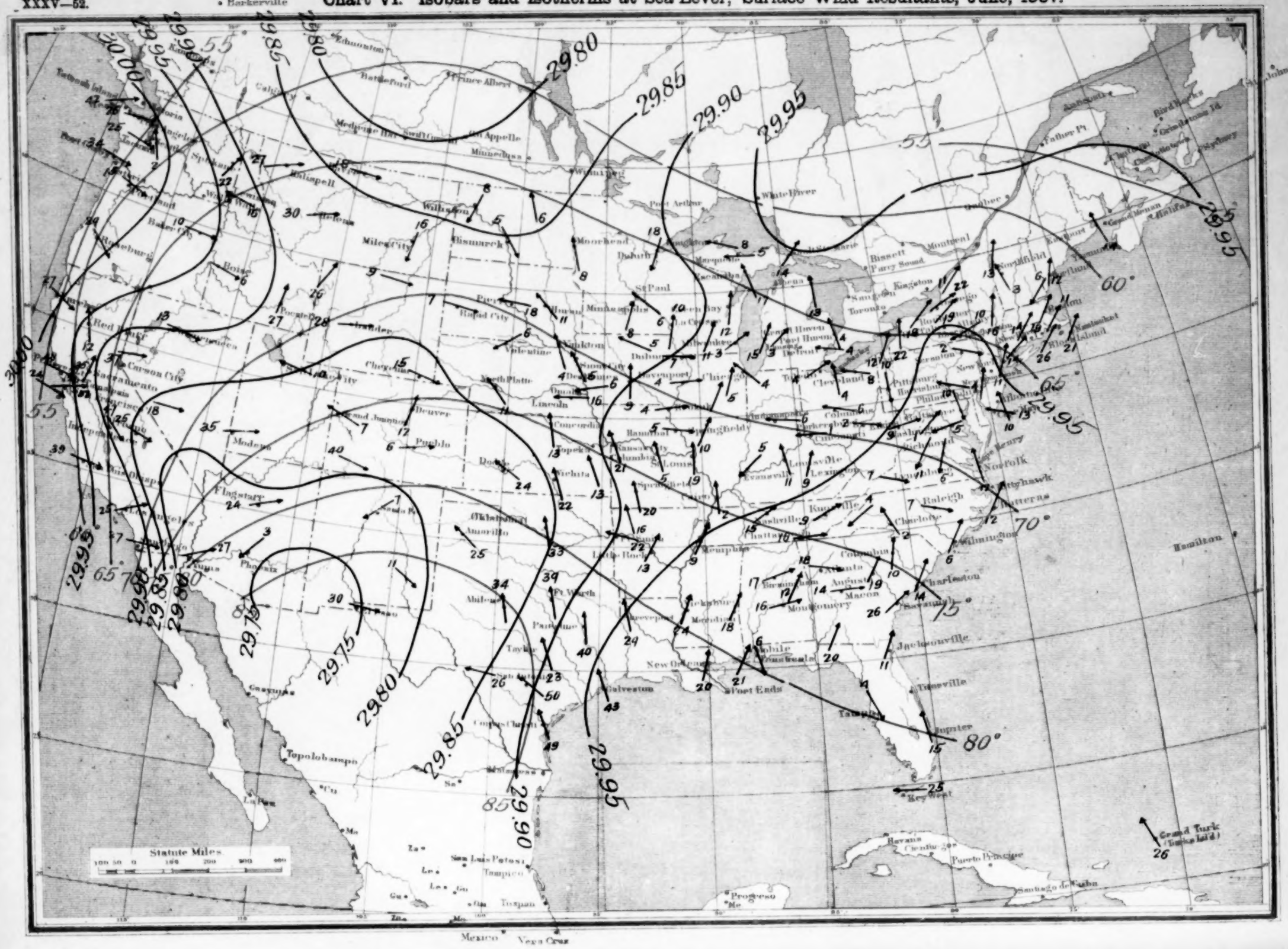
Chart VI. Isobars and Isotherms at Sea Level; Surface Wind Resultants, June, 1907.